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**THE LEXICON-SYNTAX INTERFACE IN
SECOND LANGUAGE ACQUISITION:
EVIDENCE FROM L2 JAPANESE**

YOKO SHOMURA

**PH.D
UNIVERSITY OF EDINBURGH
2002**



DECLARATION

I hereby declare that this thesis was composed by myself and the work contained therein is of my own execution and authorship.

Yoko Shomura

30 January 2002

DEDICATION

To my parents

ACKNOWLEDGMENTS

This thesis could not have been written without the help and support of many people, and I would like to thank them all for their various contributions during this four and half years.

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ABSTRACT

This thesis deals with the second language (L2) acquisition of the interface between verb meaning and morphosyntax in Japanese by English-speaking learners. The general aim of the study is to explore the influence of lexical semantic features on the acquisition of the syntax of intransitive and transitive verbs in L2 Japanese. Two different grammatical phenomena are targeted in the study: split intransitivity and the transitivity alternation. The aim of the study with respect to each grammatical phenomenon is outlined as follows.

First, the purpose of the study on split intransitivity is to investigate whether the knowledge of the unaccusative-unergative distinction exhibited by native Japanese and acquired by L2 learners of Japanese displays any sensitivity to the Split Intransitivity Hierarchy, which is proposed by Sorace (2000) for European languages.

Second, our interest in the transitivity alternation is to determine whether the difference in the features involved in the intransitive/transitive alternation will affect L2 acquisition. These features include not only the mapping between the lexicon and syntax, but also the presence of a morphological marker distinguishing transitive and intransitive verbs. The central issue to be addressed is whether learners experience more difficulty in acquisition when the first language (L1) and L2 share the same properties in the target verb class at the lexical-semantic level, but differ in how to encode it at the morphological level. The findings from previous studies suggest that learners tend to experience more difficulty in the case where the L1 marks the distinction with overt morphology and L2 does not, than in the opposite case where L1 does not encode the property with overt morphology and L2 does. This is a point which our study aims to further test.

Three independent experimental studies were conducted to investigate these issues. Two groups of learners took part in the study: one who had never been exposed to Japanese outside the classroom; and the other who had almost completed a 10-month stay in Japan. Native Japanese speakers also participated in the experiments as a control group. Different constructions were tested, including Quantifier Floating, the *takusan* construction, and the *kake* construction for monadic verbs; Japanese native verbs, Sino-Japanese verbs, and psych verbs for dyadic verbs. The methods used in each experiment are: a Magnitude Estimation grammaticality judgment test for Experiment I; a Magnitude Estimation grammaticality judgment test and a picture-cued task for Experiment II; and a preference test for Experiment III.

With regard to split intransitivity, the research shows that the judgments on unergative verbs by both learners and native speakers were conditioned by the Split Intransitivity Hierarchy. In contrast, the judgments about unaccusative by learners display an uneven pattern, which may be due to the optionality of the syntactic manifestation of unaccusativity in Japanese.

The results with respect to the transitivity alternation reveal that the learners correctly differentiate between alternating and non-alternating verbs with Japanese native verbs which encode the difference using overt morphology, while they fail to do so with Sino-Japanese verbs, which do not mark the transitive/intransitive distinction with overt morphology. The results confirm the findings of previous research by Juffs (1996), Chen (1996), and Montrul (1997, 2000).

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LIST OF ABBREVIATIONS

ACC	Accusative Marker
AGR	Agreement
AP	Aspectual Phrase
CAUS	Causative Marker
CL	Clitic
COMP	Complementizer
DAT	Dative marker
DP	Determiner Phrase
EM	Event Measurer
EXP	Experiencer
GB	Government and Binding
GEN	Genitive Marker
GL	Generative Lexicon
IL	Interlanguage
Infl	Inflection
IP	Inflection Phrase
L1	First Language
L2	Second Language
ME	Magnitude Estimation
NEG	Negation
NOM	Nominative Marker
NOML	Nominalizer
NP	Noun Phrase
NQ	Numeral Quantifier
OBJ	Object
OE	Object Experiencer
OR	Originator
PASS	Passive Marker
PFV	Perfective Aspect Marker
PL	Plural
PLD	Primary Linguistic Data
PP	Prepositional Phrase
pp	past particle

Prog F	Progressive Form
QF	Quantifier Floating
RRG	Role and Reference Grammar
SE	Subject Experiencer
SIH	Split Intransitive Hierarchy
Spec	Specifier
SUBJ	Subject
TOP	Topic Marker
T/SM	Target of Emotion and Subject Matter of Emotion
UAH	Universal Alignment Hypothesis
UG	Universal Grammar
UH	Unaccusative Hierarchy
UTAH	Uniform Theta Assignment Hypothesis
UTH	Unaccusative Trap Hypothesis
V	Verb
VP	Verb Phrase

CHAPTER 1

INTRODUCTION

1.0 Introduction

Since the Principle and Parameters approach was presented within Government and Binding (GB) theory (Chomsky 1981, 1986), a considerable number of studies have been conducted on the role of Universal Grammar (UG) in L1 and L2 acquisition, addressing such questions as the availability of UG for L2 learners, or the possibility of parameter-resetting by L2 learners. Although most of these studies tend to be devoted to the acquisition of parametric values, rather less attention has been paid to other areas such as the lexicon. However, in recent years, the importance of the lexicon in L2 acquisition has come to be recognised from the perspective of the syntax-semantics interface, and there have been growing interest in the L2 acquisition of verb semantics and morphosyntax.

Many researchers have worked on various grammatical phenomena to investigate how the link between a verb's meaning and syntactic representation is acquired: for example, the dative alternation (Mazurkewich 1984a, 1984b; Hawkins 1987; White 1987, 1991a; Bley-Vroman and Yoshinaga 1991; Moore 1993), locative verbs (Juffs 1996; Inagaki 1997); the unaccusative/unergative distinction (Yip 1995; Sorace 1993a, 1993b, 1995a, 1995b; Hirakawa 1995, 2000, among others), the causative/inchoative alternation (Adjemian 1983; Montrul 1997, 1999; Toth 2000 among others), psych verbs (Juffs 1996; White et al. 1998, 1999; Montrul 1998, Chen 1996), and many more.

Although these studies focus on different grammatical phenomena, the research questions which they aim at overlap substantially.

- (a) What is the role of L1 and UG in L2 acquisition of the syntax-semantics interface?
- (b) How is L2 acquisition affected by the difference in morphosyntax pattern between L1 and the target language?
- (c) How is the L2 grammar constrained? What is the developmental path like, in L2 acquisition of the syntax-semantics interface?

The present study also focuses on the mapping between a verb's meaning and syntactic representation, specifically on the acquisition of split intransitivity with monadic verbs and the inchoative/causative alternation with dyadic verbs.

1.1 Monadic verbs - split intransitivity

The purpose of the study of monadic verbs is twofold, one related to a purely linguistic perspective, and the other originating from the perspective of L2 acquisition.

From a linguistic perspective, the main concern is testing the cross-linguistic validity of the Unaccusative Hypothesis. Since the hypothesis was proposed by Perlmutter based on data in Dutch, the research into its applicability has been conducted mainly in European languages, such as Italian (Burzio 1986; Belletti and Rizzi 1981), French (Legendre 1989; Labelle 1990), English (Keyser and Roeper 1984; Zubizarreta 1987; Levin and Rappaport Hovav 1995), among others. The Unaccusative Hypothesis is claimed to be universally applicable, regardless of typological differences between languages. In fact, there have been sporadic applications of the hypotheses to other languages apart from the European languages mentioned above. The same can be said for Japanese; the study of split intransitivity in Japanese was begun only recently by Japanese linguists (Miyagawa 1989; Takezawa 1991; Tsujimura 1990a, 1990b, 1990c, 1991, 1994, 1996; Terada 1987, 1990; Kishimoto 1996; Kageyama 1994, 1996). Like the studies of European languages, these studies can also be categorised into three different approaches -the purely syntactic approach (Miyagawa 1989; Takezawa 1991; Terada 1987, 1990), the purely semantic approach (Kishimoto 1996), and the interface approach (Tsujimura 1991, 1994, 1996, Kageyama 1994, 1996). However, as pointed out in Tsujimura (1990c, 1994), studies into split intransitivity in Japanese share the same problem with those in European languages, namely the variation in the syntactic behaviour of unaccusatives/unergatives within and across languages, which have come to be known as "unaccusative mismatches". In order to demonstrate that the Unaccusative Hypothesis is really applicable to any language, the first thing to do is "to single out, among the semantic components of verbs, those that, across languages, are relevant to the syntax of unaccusativity, and to explain the principles that govern variation, both within and across languages" (Sorace 1998ms: 2). However, regardless of which approach they are based on, most theories fail to give a proper account of the variation in unaccusativity/unergativity within and across languages.

Sorace (2000) claims that the approaches which do not pay differential attention to the lexical semantic components underlying split intransitivity cannot deal with the different syntactic behaviour of an identical unaccusative or unergative verb within and across languages, and she introduces a new concept called "gradient effects" on the syntax of unaccusatives and unergatives. Further details will be given in Chapter 2, but here, we shall briefly look at the main difference between her approach and the traditional approaches. The main idea behind her approach is that she characterises the unaccusative/unergative distinction, as reflecting a gradient hierarchy of aspectual semantic components, namely "the Split Intransitivity Hierarchy". The hierarchy identifies a core and a periphery according to the magnitude of the effect on the syntax of unaccusatives and unergatives, which makes it possible to give an account of the variance of mapping across languages in terms of different cut-off points along the hierarchy.

This hierarchy is elaborated based on data from five Western European languages: Dutch, Paduan, French, German, and Italian, with the ultimate goal of its application to other languages, but studies on the Split Intransitivity Hierarchy have been made exclusively in European languages so far. In this regard, it is worth trying to apply the Split Intransitivity Hierarchy to non-Indo European languages such as Japanese, because there has been currently no evidence to confirm the applicability of the Split Intransitivity Hierarchy to typologically different languages. This is one of the contributions of this dissertation.

Second, the interest of this study from an L2 acquisition perspective is closely related to questions (a) and (c) posed in section 1.0.— the role of UG in the L2 acquisition of the semantic-syntactic interface, and the developmental path taken by L2 learners in the acquisition. In fact, apart from a series of studies by Sorace (1993a, 1993b, 1995a, 1995b), there have been only a few experimental studies targeting the acquisition of split intransitivity (Yip 1995; Balcom 1997; Oshita 1997, 1998 Yuan 1996; Hirakawa 1999, 2000, 2001), and none of these have introduced the concept of the "gradient effect" in acquisition of the Split Intransitivity Hierarchy.

The studies of Sorace (1993a, 1993b, 1995a, 1995b) have been designed specifically to categorise all the factors which learners will resort to in the acquisition of split intransitivity in Italian and French. Postulating the Split Intransitivity Hierarchy is a device to explore the interplay of semantic components and syntactic

manifestations. The main findings from these studies can be thus summarised: (a) L2 learners are conditioned by the Split Intransitivity Hierarchy in their judgments — they have more determinate judgments on core verbs along the hierarchy, while they are less determinate in their judgments on peripheral verbs; (b) the robustness and consistency of the input as evidence seems to affect the outcome of acquisition.

Sorace points out in the comparison between Italian and French that learners of Italian experience less difficulty in acquiring the language, because Italian offers more robust and consistent evidence, while learners of French have more difficulty, because of the opaqueness and ambiguity of the evidence they receive. What kind of scenario can then be assumed for Japanese? We shall look at this in detail later, but past studies have revealed that Japanese does exhibit ambiguity and opaqueness like French. In particular, unaccusatives display optionality with some constructions, such as Quantifier Floating (QF) or Case Drop. This point will be revisited in Chapter 6.

This study is the first application of the Split Intransitivity Hierarchy to a non-Indo European language, and therefore a contribution to the ongoing research on the acquisition of split intransitivity.

1.2. Dyadic verbs - inchoative/causative alternations and psych verbs

The study of dyadic verbs has been motivated by the research questions (a) and (b) in section 1.0: (a) the role of UG and L1 in the L2 acquisition of the syntax-semantics interface; (b) the influence of the differences between the morphosyntax patterns in L1 and L2 in L2 acquisition. The role of L1 and UG is intensively discussed in Montrul (1997,1999), who proposes a "modular view of transfer". This view claims that both UG and L1 influence play a role in L2 acquisition, but at different levels: UG has a influence at the argument-structure level, while L1 knowledge is involved in L2 acquisition at the morphological level. This idea is closely related to the second issue (b). The central concern is: when L1 and the target language share the same properties at the lexical-semantic level, but differ in how to encode them at the morphological level, do learners experience more difficulty in its acquisition? Further, if this is the case, the question is how and when L1 influence emerges and affects the interlanguage grammar. For instance, whether learners whose L1 does not have overt morphology at the syntactic level experience more difficulty than those whose L1 has overt morphology, when they are learning a language which has some particular

morphological manifestation. In addition, a further concern is whether this would hold in the opposite direction.

Several studies have explored the L2 acquisition of morphosyntactic differences between L1 and L2. Focusing on the morphological pattern in L1 and the target language, these studies can be classified into two types.

(a) L1 without morphology → L2 with morphology

ex. causatives/inchoative alternations

L1: English → L2: Turkish (Montrul 1997, 2000)

L1: English → L2: Spanish (Montrul 1997, 1999, 2000; Toth 2000)

(b) L1 with morphology → L2 without morphology

ex. psychological verbs

L1: Chinese → L2: English (Juffs 1996; Chen 1996)

ex. causatives/inchoative alternations

L1: Chinese → L2: English (Juffs 1996)

L1: Turkish → L2: English (Montrul 1997, 2000)

L1: Spanish → L2: English (Montrul 1997, 2000)

The details of the results for each study will be reviewed with some examples in Chapter 5, but here the main finding for each type is briefly described.

Interestingly, the studies of each type have reported quite similar findings. Firstly, Montrul (1997, 1999, 2000) reports a study on L2 acquisition of the causative/inchoative alternations in Type (a) that English-speaking learners of Spanish found less difficulty in accepting correct intransitive forms with the reflexive clitic "se" (with morphology) than in rejecting incorrect intransitive zero-derived forms (without morphology) despite a lack of overt morphology in their own language. Similarly, Toth (2000) shows that English-speaking learners did not have many problems using "se" in a variety of verb classes though some overgeneralization errors were found.

With respect to Type (b), the studies reveal that this case is seriously problematic for learners. Juffs (1996) and Chen (1996) independently investigated the L2 acquisition of psych verbs by Chinese-speaking learners of English. Juffs' results show a preference for the periphrastic 'make' construction of psych verbs (ex. *John's news made*

me disappointed). Chen reports that Chinese learners of English failed to notice zero-morphology in English, and wrongly accepted the false sentence such as “**People frighten wars*” (Chen 1997:403). Unlike the results in Juffs (1996), Montrul (1997, 2000) shows that neither Turkish- nor Spanish-speaking learners of English showed any preference for the periphrastic ‘*make*’ construction. However, Spanish-speaking learners of English wrongly rejected zero-derived forms such as “*The ship sank*” more than the control group and the Turkish-speaking group, which implies the possibility that they are not aware of zero-causative morphology.

The conclusion that one could draw from the results of these two types of study is that a L1-L2 difference in morphosyntactic pattern would not necessarily lead to a learning difficulties. For instance, Toth’s (2000) study of Spanish show that English-speaking learners whose L1 does not mark the causative/inchoative alternation with causative morphology did not find great difficulties in acquiring the overt morphology “*se*”; however, this does not hold in reverse. Juffs’ (1996) and Chen’s (1996) studies confirm that learners whose native language has overt morphology, such as Chinese, faced great difficulties in their L2 acquisition of psych verbs in English, which do not have an overt marker. What can be predicted here is that it is not just the difference, but also the direction of the morphosyntactic patterns of L1 and L2 which influence the degree of difficulty in acquisition, and it seems that this result shows a learning asymmetry.

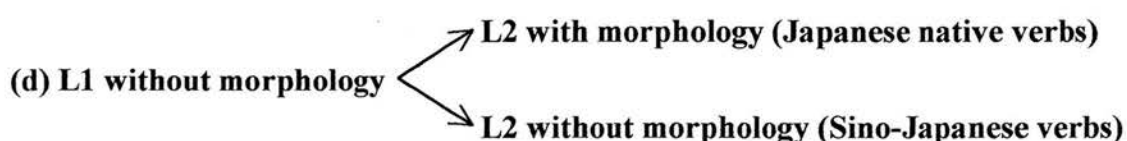
Here, a new question arises: What happens in the case where both L1 and L2 have the same pattern of morphological manifestation, such as both having zero-morphology, which can be labeled Type (c)? Would this pattern be easier or problematic compared to Type (b)?

(c) L1 without morphology → L2 without morphology

Juffs (1996) and Chen(1996) suggest, based on their findings, that pattern (b) would be problematic for L2 learners. Would this be due to the L1-L2 difference in morphological manifestation, or would it be simply because a grammatical property, which lacks overt morphological manifestation, is difficult for learners to acquire, no matter whether their L1 has it or not? This is a point which needs to be clarified.

With the aim of giving answers to these questions, this study sets out to explore the L2 acquisition of two different verb classes in Japanese: Sino-Japanese verbs, which do not

mark the causative/inchoative alternation with any morphological marker; another is the synonymous Japanese native verbs which do mark the alternation with a suffix. These verb classes are suitable for exploring the influence of overt/covert morphology, because the synonyms share the same argument structure while differing in morphology, and this makes it possible to compare the degree of difficulty experienced by learners that is due only to this factor. This study targets English-speaking learners of Japanese as the subjects, since English does not mark the causative/inchoative alternation with a morphological marker. This pattern can be illustrated as follows:



This study sheds light on a new dimension of the ongoing research of L2 acquisition in this domain.

1.3 Overview of this thesis

This thesis consists of seven chapters. After the Introduction in this Chapter 1, Chapter 2 presents the theoretical background on unaccusativity. The Unaccusative Hypothesis of Perlmutter (1978) is introduced first, and then three different types of approach to split intransitivity are outlined: the syntactic approach, the semantic approach, and the interface approach. The main studies which are reviewed are: Burzio (1986), and Kayne (1993) for the syntactic approach; Van Valin (1990), and Dowty (1991) for the semantic approach; Levin and Rappaport Hovav (1995), Sorace (2000), McClure (1995), Borer (1994), and van Hout (1994) for the interface approach.

In Chapter 3, previous studies on split intransitivity in Japanese are reviewed. In order to identify split intransitivity in Japanese, seven different phenomena are presented as evidence: floating quantifiers (Miyagawa 1989), resultative constructions (Tsujimura 1990a, 1990b, 1994, 1996), *te-iru* constructions (Takezawa 1991), case-marker drop (Kageyama 1993), *takusan* construction (Kageyama 1993, 1996), *kake* deverbial nominalisations (Kishimoto 1996; Tsujimura and Iida 1999), and Sino-Japanese complex predicates (Miyagawa 1989; Tsujimura 1990).

In Chapter 4, transitive/intransitive verbs in English and Japanese are described and

compared. This chapter is divided into two parts. In the first part, monadic verbs which do not allow the transitive/intransitive alternations are examined in the light of the "Split Intransitivity Hierarchy" (Sorace 2000). In the second part, based on the claims by Levin and Rappaport Hovav (1995), and Kageyama (1996), two types of dyadic verbs are examined: one which allows the transitive/intransitive alternation, and another which does not. Finally recent studies on psych verbs in English and Japanese are outlined, including Belletti and Rizzi (1988), Grimshaw (1990), Jackendoff (1990), and Katada (1996).

In Chapter 5, previous L2 studies of split intransitivity and the transitive alternation are reviewed: on L2 English (Zobl 1989; Yip 1995; Balcom 1997; Oshita 1997; 1998; Juffs 1996), L2 Italian (Sorace 1993a, 1993b, 1995a), L2 Spanish and Turkish (Montrul 1997, 1999), L2 Chinese (Yuan 1999), and L2 Japanese (Hirakawa 1995, 2000a, 2000b). Prior to the review of these studies, the three main issues which relate to our study are discussed: L1 influence (transfer) and UG, the role of positive and negative evidence, and optionality.

In Chapter 6, the results of three main studies which have been carried out for this thesis are reported. The constructions which have been used are: "Quantifier Floating", "*takusan*" construction, and "*kake*" construction for monadic verbs, and "Japanese native verbs", "Sino-Japanese verbs" and "psych verbs" for dyadic verbs.

In Chapter 7, the overall findings of the three main studies are summarised and the main issues underlying this thesis are discussed. Finally, this chapter is concluded by suggesting potential areas for further research.

CHAPTER 2

THEORETICAL BACKGROUND

2.0 Introduction

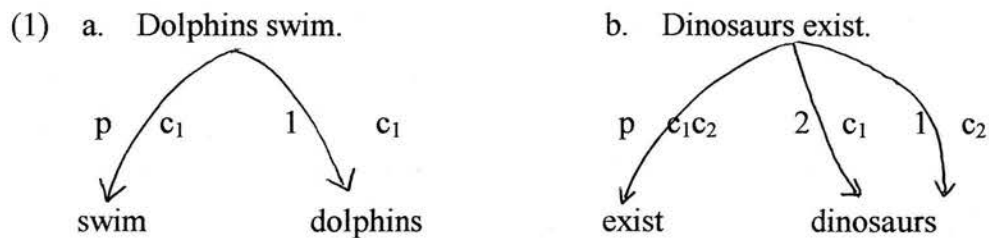
In this chapter, the main theories of unaccusativity which have been proposed in the literature will be reviewed. The unaccusative hypothesis was originally put forward by Perlmutter (1978) within the framework of Relational Grammar. Inspired by Perlmutter's work, many subsequent studies on unaccusativity have been carried out, in a variety of different frameworks. These studies can be classified into three different types depending on the scholar's point of view in regard to this controversial issue – whether unaccusativity should be treated as a syntactic or semantic phenomenon. The three approaches are: (a) the purely syntactic approach, (b) the purely semantic approach, and (c) the interface (concerning both syntax and semantics) approach. The interface approach can be further classified into two subcategories according to the scholar's view of how the interface works: the lexical-entry driven approach and the predicate-based approach. In short, the lexical-entry driven approach assumes that lexical entries play a vital role in the mapping, while the predicate-based approach predicts that the syntactic configurations in the syntax of the entire predicate hold the key to the interpretation of individual arguments in the clause.

Following the presentation of Perlmutter's work, the studies which will be reviewed in this chapter are those of: Burzio (1986), and Kayne (1993) for the purely syntactic approach; Van Valin (1990), and Dowty (1991) for the purely semantic approach; Levin and Rappaport Hovav (1995) for the lexical-entry driven approach in the interface approach; Sorace (2000) presenting the Split Intransitivity Hierarchies in the interface approach, and McClure (1995), Borer (1994), van Hout (1994, 1996) and Pustejovsky (1988, 1991, 1995) for the predicate-based approach in the interface approach.

2.1 The Unaccusative Hypothesis

The Unaccusative Hypothesis was first proposed by Perlmutter (1978) within the framework of Relational Grammar. Relational Grammar assumes two levels of syntactic representation - the "initial stratum", and the "final stratum". Initial 1 indicates the subject and Initial 2 indicates the direct object. The hypothesis claims that there are certain intransitive clauses which have an Initial 2 but not an Initial 1.

In other words, the hypothesis can be paraphrased as follows: there is a special type of intransitive clause having an underlying direct object but no underlying subject, distinct from the usual type of intransitive clause having an underlying subject but no underlying object. Perlmutter calls the former type “unaccusative” and the latter type “unergative”. For example, “Dolphins swim” which is an unergative phrase, and “Dinosaurs exist” which is an unaccusative phrase, can be illustrated as follows:



(1a) contain a 1-arc but no 2-arc, which is defined as unergatives, while (1b) contains a 2-arc but no 1-arc, which is defined as unaccusative.

Perlmutter (1978: 161) argues that “initial unergativity vs. unaccusativity is predictable from the semantics of the clause” (Perlmutter 1978:161). He also claims that the distinction is cross-linguistically uniform, though the degree varies from language to language. This claim is clearly presented as the “Universal Alignment Hypothesis” in Perlmutter and Postal (1984: 97).

(2) Universal Alignment Hypothesis

There exist principles of universal grammar which predict the initial relation borne by each nominal in a given clause from the meaning of the clause.

This hypothesis claims that there is an explicit and universal connection between semantic roles and grammatical relations. Preceding this hypothesis, Perlmutter had already suggested that “the necessary first step is to attempt to formulate the principle predicting initial unergativity vs. unaccusativity” (Perlmutter 1978: 161). He attempts to single out some of the fundamental properties which determine initial unergativity vs. unaccusativity. His list is shown below:

(3) Predicates Determining Initially Unergative Clauses

a. Predicates describing willed or volitional acts:

work, play, speak, talk, smile, grin, frown, grimace, etc.

b. Manner-of-speaking verbs:

whisper, shout, mumble, grumble, growl, bellow, etc.

c. Predicates describing sounds made by animals:

bark, neigh, whinny, quack, roar (voluntary), chirp, etc.

b. Certain involuntary bodily processes:

cough, sneeze, hiccough, belch, burp, vomit, defecate, etc.

(4) Predicates Determining Initially Unaccusative Clauses

a. Predicates expressed by adjectives in English:

This is a very large class, including predicates describing sizes, shapes, weights, colors, smells, states of mind, etc.

b. Predicates whose initial nuclear term is semantically a Patient:

burn, fall, drop, sink, float, slide, slip, glide, soar, flow, ooze, etc.

Inchoatives:

melt, freeze, evaporate, vaporize, solidify, crystallize, dim, brighten, etc.

c. Predicates of existing and happening:

exist, happen, transpire, occur, take place, ensure, result, show up, etc.

d. Involuntary emission of stimuli that impinge on the senses (light, noise, smell, etc.):

shine, sparkle, glitter, glisten, glow, jingle, clink, clang, snap (involuntary), etc.

e. Aspectual predicates:

begin, start, stop, cease, continue, end, etc.

f. Durative:

last, remain, stay, survive, etc.

(Perlmutter 1978:162-163)

Perlmutter (1978) warns that there could be some mismatches in spite of the cross-linguistic validity of his formulation. He gives the following three reasons.

- a. In English, homophonous verbs are used in different clause types (e.g. *slide*).
- b. The lists of predicates in (3) and (4) are still incomplete.
- c. Sometimes, it is not apparent what might be the synonym in one language which is equivalent to a given verb in another language. Synonymy between verbs in different languages is not always obvious (*travel* in English and *reizen* in Dutch).

Although the initial hypothesis from Perlmutter (1978) put the emphasis on semantic

roles and cross-linguistic validity, Perlmutter (1989) shows some shift in his approach, claiming that the syntactic analysis should be independent of any semantic or thematic representation, which made his account similar to that of Government and Binding Theory, but Perlmutter's initial work inspired many researchers to carry out studies within various frameworks. In the next section, we shall look at some of these studies.

2.2 Approaches to unaccusativity

Since the Unaccusative Hypothesis was proposed by Perlmutter (1978), the difference in syntactic and semantic properties between unaccusative and unergative verbs has been discussed within different frameworks: Relational Grammar (Perlmutter and Postal 1984; Rosen 1984), Government and Binding Theory (Burzio 1986; Keyser and Roeper 1984; Grimshaw 1990; Levin and Rappaport Hovav 1995), and Lexical Functional Grammar (Bresnan and Zaenen 1990).

One issue which has always been controversial is whether unaccusativity should be treated as a syntactic or a semantic phenomenon. There have been quite a few theories presented which differ in their approach to the status of unaccusativity. These can be classified into three main approaches: the purely syntactic approach (Burzio 1986; Kayne 1993), the purely semantic approach (Van Valin 1990; Dowty 1991), and the interface (from both a syntactic as well as a semantic perspective) approach (Levin and Rappaport Hovav 1995; Sorace 2000). The definition of unaccusativity differs considerably among the three approaches. To describe this briefly, the purely syntactic approach regards unaccusativity as a unified phenomenon – all unaccusative verbs share a common syntactic configuration, no matter what semantic class they belong to. It is denied that there are meaningful semantic generalisations which can account for the distinction between unergatives and unaccusatives. In contrast, the purely semantic approach claims that the distinction between unaccusative and unergative verbs can be explained exclusively on semantic grounds. In other words, verb meanings are crucial for characterising what is termed “split intransitivity”. Finally, the view of unaccusativity in the interface approach has been well described by Levin and Rappaport Hovav (1995) – unaccusativity is *semantically determined* and *syntactically encoded*. That is, the distinction between unergatives and unaccusatives is manifested syntactically, but it is basically determined semantically. Since there is some confusion between the purely semantic approach and the interface approach, it will be useful to clarify the differences between them. A crucial difference is that the purely

semantic approach denies categorically that unaccusatives (split intransitivity) are syntactically encoded, and explains the phenomenon entirely without reference to syntactic notions, while the interface approach does not. In this chapter, each of these approaches to unaccusativity will be examined in detail. Let us start with Burzio (1986), and Kayne (1993) for the purely syntactic approach.

2.2.1 The syntactic approach

In this section, Burzio's (1986) and Kayne's (1993) syntactic approaches to unaccusativity will be reviewed. Burzio (1986) analyses the syntactic behaviour of Italian auxiliaries, and develops the Unaccusative Hypothesis within the framework of Government and Binding Theory. Kayne (1993) analyses auxiliaries in several languages including English, Spanish, French, Italian, and some of their dialects, and he presents an integrated theory to account for auxiliary selection, both language-internally and cross-linguistically. Let us start with a review of Burzio (1986).

2.2.1.1 Burzio (1986)

Burzio (1986) adopts the Unaccusative Hypothesis to account for Italian intransitive verbs within the framework of Government and Binding Theory. By scrutinising auxiliary verbs in Italian, Burzio identifies two types of intransitive verb, which display different syntactic behaviour. He calls them "unergative" and "ergative", the latter being equivalent to Perlmutter's "unaccusative". Burzio presents a range of evidence to illustrate the different syntactic behaviour between unergatives and unaccusatives (ergatives). In this section, we shall concentrate on auxiliary selection and NE-cliticization. Compare the following Italian examples.

- (5) a. Giovanni arriva
 'Giovanni arrives'
- b. Giovanni è arrivato
 is arrived
 'Giovanni has arrived'
- (6) a. Giovanni telefona
 'Giovanni telephones'

- b. Giovanni ha telefonato
has telephoned
'Giovanni has telephoned'

(Burzio 1986: 20)

At first glance, the verbs in (5a) and (6a) look the same type of intransitive verb, but they clearly display different syntactic behaviour in auxiliary selection, as seen in (5b) and (6b). Burzio proposes that, in Italian, all unaccusative verbs systematically select the ESSERE auxiliary as in (5b), while all unergative verbs systematically select the AVERE auxiliary as in (6b). Thus, auxiliary selection in Italian is a key distinguishing criterion between the unaccusative and unergative classes of intransitive verb.

Burzio accounts for the mechanism of auxiliary selection in relation to the distribution of past participle agreement ('*pp* agreement'). He points out that the distribution of ESSERE overlaps with that of *pp* agreement. Look at the examples in (7):

- (7) a. Passive: Maria è stata accusata.

Maria is been accused (fem) (E; *pp ag't*)

Maria has been accused.

- b. Reflexive *si*: Maria si è accusata

Maria herself is accused (fem) (E; *pp ag't*)

Maria has accused herself.

- c. Ergative V: Maria è arrivata

Maria is arrived (fem) (E; *pp ag't*)

Maria has arrived.

(Burzio 1986:54)

Both auxiliary ESSERE and *pp* agreement are observed in these examples, and they appear closely related to each other. Burzio proposes two rules to explain the distribution of these phenomena.

- (8) a. **ESSERE ASSIGNMENT:** The auxiliary will be realized as *essere* whenever a 'binding relation'¹ exists between the subject and a 'nominal contiguous to the verb'.

b. **PAST PARTICIPLE AGREEMENT :** A past participle will agree (in gender and number) with an element holding a 'binding relation' with its 'direct object'.
(Burzio 1986:55-56)

The idea behind these rules is that both ESSERE assignment and pp agreement are caused by a binding relationship between two NPs, which is shown in (9) and (10) respectively.

(9) ESSERE ASSIGNMENT

i. NP cl - V.....

ii. NP V NP...

(10) PAST PARTICIPLE AGREEMENT

i. cl-V NP ...

ii. NP V NP ...

(Burzio 1986:56)

As explained in (8a), the ESSERE auxiliary is assigned when there is a binding relation between a clitic and the direct object as in (9i), also between the subject and the direct object as in (9ii). Based on this syntactic analysis, the examples in (7) can be explained as follows:

- (11) a. [Maria] è stata accusata t
Maria is been accused (fem)
b. [Maria] si è accusata [e]
Maria herself is accused (fem)
c. [Maria] è arrivata t
Maria is arrived (fem)

¹ The definitions of c-command and binding are as follows (Haegeman 1994:212):

(a) C-command: A c-commands B if and only if A does not dominate B and every X that dominates A also dominates B.

(b) Binding: A binds B if and only if A c-commands B and A and B are coindexed.

The passive in (11a) and the unaccusative in (11c) are examples of (9ii) and (10ii). In (11b), *pp* agreement is triggered by the relation between the clitic and the empty category, whereas ESSERE assignment is triggered by the relation between the reflexive clitic and its antecedent as in (9i). Burzio's Generalisation also explains another Italian syntactic phenomenon, NE-Cliticization, whose distribution Burzio describes as follows:

(12) Ne-Cl(iticization) is possible with respect to all and only direct objects.

(Burzio 1986: 26)

This is shown by the following examples:

- (13) a. Giovanni ne inviterà molti (dir. object)
Giovanni of them will invite many
 Giovanni will invite many of them.
- b. *Giovanni ne parlerà a due (indir. object)
Giovanni of-them will talk to two
- c. *Molti ne arriveranno. (subject)
many of-them arrive
- d. *Molti ne telefoneranno (subject)
many of-them will telephone

(Burzio 1986:23)

As shown in (13), NE-Cliticization is allowed only with direct object, but not with an indirect object or a subject. According to Burzio, NE is a clitic pronoun, which attaches to a verb head leaving its specifier behind. Therefore, the NP which NE is extracted from must be positioned lower than V' in the D-structure² (i.e. the complement of V). This can be observed in the contrast between unaccusative and unergative verbs as in (14) and (15).

² In Government-Binding Theory, two levels of syntactic representations are posited (Haegeman 1994:304-305):

- (i) D-structure: This level encodes the lexical properties of the constituents of the sentence. It represents the basic argument relations in the sentence. External arguments are base-generated in the subject position relative to their predicate; internal arguments are governed by the predicate in their base-position.
- (ii) S-structure: This level reflects the more superficial properties of the sentence: the actual ordering of the elements in the surface string, and their case forms.

- (14) a. Telefoneranno molti esperti.
 will telephone many experts
 “Many experts will telephone”
- b. *Ne telefoneranno molti.
 of-them will telephone many
 “Many of them will telephone”
- (15) a. Arriveranno molti esperti.
 will arrive many experts
 “Many experts will arrive”
- b. Ne arriveranno molti.
 of-them will arrive many
 “Many of them will arrive”

(Burzio 1986: 21-22)

In both (14a) and (15a), the subjects appear post-verbally, but their behaviour in NE-cliticization is different – (15b) is grammatical, while (14b) is not. This shows us that the NP in (14b) originates outside V', while the NP in (15b) occurs in a position dominated by V'. This phenomenon supports the claim made in Burzio's Generalisation that unaccusatives take an internal argument while unergatives take an external argument.

2.2.1.2 Kayne (1993)

Kayne (1993) addresses the core question of how best to account for the difference in auxiliary selection between the languages with systematic HAVE (ex. English, Spanish), and the ones having either HAVE or BE.

Kayne gets his initial insight from Benveniste (1966: sect.15), whose claim is that “(the evolution of) auxiliary HAVE and main verb (i.e. ‘possessive’) HAVE should be thought of in parallel fashion” (Kayne 1993: 3). Thus, Kayne does not assume an auxiliary selection *rule*, instead, he attempts to present an integrated theory which can account for any type of auxiliary selection, both language-internally and

cross-linguistically.

Before starting his discussion of each type – English/Spanish, and French/Italian – Kayne summarises Szabolcsi's (1981, 1983) analysis of the Hungarian possessive construction. He believes that possessive HAVE and auxiliary HAVE can be analysed in the same way, though there is a trivial difference in the structure. Let us start looking at the first type of languages, those with systematic HAVE such as English and Spanish.

2.2.1.2.1 English and Spanish auxiliary HAVE

With respect to auxiliary selection, English and Spanish are in the same category – HAVE (HABER) is always selected by all verbs, even unaccusatives. Kayne gives the structure of the active auxiliary + past participle construction with a transitive verb as follows:

(16) ...BE [_{DP} SPEC D/P⁰ ... [_{VP} DP_{subj} [V DP_{obj}]] (Kayne 1993: 8)

Based on Kayne's account, in this construction, DP_{subj} moves twice. The first movement is from within VP to Spec of the larger DP as shown in (17).

(17) ...BE [_{DP} DP_{subj/i} D/P⁰ ... [_{VP} [e]_i...] (Kayne 1993: 8)

The second movement is from Spec of the larger DP to Spec of BE, which happens only if D/P⁰ incorporates to BE, and Spec of DP is assimilated to an A-position. The second movement and incorporation are illustrated below:

(18) DP_{subj/i} D/P_e + BE [_{DP} [e]_i D/P⁰ ... [_{VP} [e]_i V DP] (Kayne 1993: 8)

As a result of the incorporation, D/P⁰ + BE is spelled out as HAVE. Possessive HAVE is also considered to be spelled out as a result of the incorporation of D/P⁰ to BE.

This is the basic account of the structure of the active auxiliary + past participle construction in English and Spanish. However, there is one crucial difference between these two languages, which is that the morphology of past participles in Spanish is more complex than that of English. Basically, the participle in Spanish can show number

and gender agreement, though only in passives. Kayne treats all the agreement reflected in the morphology of the participle as a single AGR node, more precisely, as what corresponds to AGR_O in Chomsky (1991). The main point that Kayne makes about active participle agreement is that no participle agreement is shown by unaccusative sentences with the auxiliary + past participle construction in Spanish, as in (19).

- (19) Maria ha llegado/*a
 “Maria has arrived” (Kayne 1993: 10)

Kayne explains that this is because the DP *Maria* does not pass through Spec of AGR_O . When it moves from within VP to the Spec of the larger DP as in (20).

- (20) ... $[_{DP} [e]_i D/P^0 AGR_O^0 [_{VP} V[e]_i]$ (Kayne 1993:10)

2.2.1.2.2 Italian auxiliary HAVE

Except in reflexive clitic sentences, Italian transitives and unergatives always select auxiliary HAVE, as in (21) and (22).

- (21) a. Maria ha comprato i libri.
 “Maria has bought the books”
 b. *Maria è comprato/a i libri.
 “Maria is bought the books” (Kayne 1993: 11)

- (22) a. Maria ha dormito.
 “Maria has slept”
 b. *Maria è dormito/a.
 “Maria is slept” (Kayne 1993:12)

Just as in Spanish, the past participle does not show any agreement with transitive and unergatives in Italian, as follows:

- (23) a. *Maria ha comprata i libri. (Kayne 1993: 11)
 b. *Maria ha dormita. (Kayne 1993:12)

Kayne argues that the absence of agreement with transitives and unergatives in Italian

can be explained in the same way as in Spanish – the DP *Maria* moves to Spec, DP without passing through Spec, AGR_O on the way. Here, Kayne attempts to give an account for this movement – why DP cannot move into Spec, AGR_O. With transitives, Kayne refers to Chomsky's (1992) discussion of minimality, and explains that this can be reduced to case assignment. That is, if the subject of a transitive verb moves into Spec of AGR_O, the object will be unable to get Case, because it cannot receive Case at any Spec position higher than Spec of AGR_O, due to locality conditions. However, with respect to unergatives, it seems to be hard to apply this account to them, because they do not have objects. As a solution, Kayne proposes that, in addition unergatives “must contain a phonetically unrealised object that needs to be Case-licensed by (Spec,) AGR_O” (Kayne 1993: 12). That is, he considers unergatives as a variant of transitives, using the term “covert transitives”.

2.2.1.2.3 Italian auxiliary BE with unaccusativity

In Italian, the past participle of an unaccusative verb must agree with the subject:

- (24) Maria è arrivata/*o.
 “Maria is arrived”

This is contrary to the case with auxiliary HAVE. Following Kayne's account, this obligatory agreement implies that DP within VP moves into Spec of AGR_O before moving into the matrix clause. This DP movement from within VP to Spec of AGR_O is not followed by D/P⁰ incorporation since D/P⁰ need not be in the structure, which means BE will be spelled out as BE. This is shown as follows:

- (25) ...BE AGR_O V... (Kayne 1993:19)

Kayne's claim can be summarised with the following three points:

1. The choice between HAVE and BE is dependent on whether or not incorporation of D/P⁰ to BE takes place.
2. The absence or presence of agreement depends on whether or not it passes through Spec of AGR_O.
3. In Spanish, D/P is necessary because Agr_SP and BE cannot be sisters.
 i.e....BE D/P⁰ AGR_S T AGR_O V...

In sum, Kayne's approach is different in that it denies the existence of the auxiliary rule. In its place, assumes that "BE" and "HAVE" are identified except for the difference in the incorporations of an abstract position.

2.2.1.3 Summary of the syntactic approach

Two different studies by Burzio (1986) and Kayne (1993) have been reviewed in this section. Both Burzio (1986) and Kayne (1993) examine auxiliaries in several languages such as English, French and Italian, but they differ in that Burzio (1986) considers auxiliary selection as a manifestation of unaccusativity, while Kayne does not.

The syntactic approach claims that unaccusativity is a unified phenomenon, which manifests a common syntactic configuration. It explicitly denies that semantic factors are involved in the syntactic characterisation of unaccusativity.

2.2.2 The semantic approach

The semantic approaches claim that the unergative-unaccusative distinction is encoded semantically but not syntactically. Within the framework of Role and Reference Grammar, Van Valin (1990) attempts to justify that these two types of intransitive verbs can be better explained on a semantic basis, that is, this phenomenon is characterised only by semantic properties, and not by syntactic ones. Preliminary to review of the fundamental concepts in Role and Reference Grammar (RRG), let us look at Vendler's (1967)/Dowty's (1979) aspectual classification of verbs, which RRG is based on.

2.2.2.1 The aspectual classification of verbs in English –Vendler (1967)/Dowty(1979)

The notion of the telic/atelic dichotomy originates with Aristotle, but it was Vendler (1967) who first categorised verbs into four classes according to their inherent aspectual properties: States; Activities; Accomplishments; and Achievements. In his article "Verbs and Times", Vendler classifies verbs based on their restrictions on combining with time adverbials and tense by using two primary diagnostic tests: whether a verb can appear in the progressive form, and whether a verb can be used in a question frame

like, “For how long-?”, “How long-?”. Vendler’s taxonomy and some examples are illustrated in (26).

(26)

States	Activities	Accomplishments	Achievements
know	run	paint a picture	recognize
believe	walk	make a chair	spot
have	swim	deliver a sermon	find
desire	push a cart	draw a circle	lose
love	drive a car	recover from illness	reach
			die

(Dowty 1979:54)

The examples from diagnostic tests will clearly demonstrate the characteristics of each category. First, compare the examples in the three different forms: progressive form, adverbial prepositional phrase “for-”, and “in-”.

(27) the progressive form “-ing”

- a. *Tom is knowing the truth. <States>
- b. Tom is running. <Activities>
- c. Tom is making a chair. <Accomplishments>
- d. *Tom is recognising her. <Achievements>

(28) adverbial prepositional phrase “for-”

- a. Tom had a dog for ten years. <States>
- b. Tom swam for an hour. <Activities>
- c. *Tom painted a picture for a week. <Accomplishments>
- d. *Tom reached the summit for a day. <Achievements>

(29) adverbial prepositional phrase “in-”

- a. *Tom loved her in a week. <States>
- b. *Tom walked in a day. <Activities>
- c. Tom built a house in a month. <Accomplishments>
- d. Tom won the race in an hour. <Achievements>

The fundamental idea behind Vendler's classification is "time schemata", characterised by two main factors: telicity/atelicity, and instantaneity/continuity. According to his analysis, as for the former, Achievements and Accomplishments have a definite end-point, which allows them to take time adverbials referring to a point in time such as "in-" as in (29c) and (29d), while States and Activities do not have a definite end-point, which does not allow them to take time adverbials referring to a point in time, "in-", as in (29a) and (29b). For the same reason, States and Activities can cooccur with time adverbials referring to the range of time such as "for-" as in (28a) and (28b), but Achievements and Accomplishments cannot as in (28c) and (28d).

With respect to the latter factor, instantaneity/continuity, the characteristics of each class are demonstrated in the examples with the progressive form. Activities and Accomplishments can take the progressive form as in (27b) and (27c), which leads to the conclusion that these two classes denote temporal, continuous events, while States and Achievements do not naturally fit in the progressive form as in (27a) and (27d). These results from the diagnostic tests and the characteristics of the four verb classes can be summarised as follows:

Table 2-1: The results from the diagnostic tests

	States	Activities	Accomplishments	Achievements
-ing	*	OK	OK	*
for-	OK	OK	*	*
in-	*	*	OK	OK

Table2-2: The four Vendler classes and the features

	telic/atelic	instantaneous/continuous	examples
States	atelic	instantaneous	<i>know, love</i>
Activities	atelic	continuous	<i>laugh, stroll</i>
Accomplishments	telic	continuous	<i>build a house</i>
Achievements	telic	instantaneous	<i>win the race</i>

However, there is some controversy about the interpretation of Achievements in the progressive form. Verkuyl (1993:36) points out that "Prog F (progressive form) has

not been accepted as a solid criterion by a great many authors”, and he gives some examples which are contradictory to Vendler’s judgements.

(30) <Achievements>

- a. She is winning this game.
- b. He is dying.
- c. She was reaching the top.
- d. Look at the screen, the Challenger is exploding now.
- e. He is discovering now that he is a homosexual.
- f. Manufacturers were beginning to find it difficult to meet the dates.

(Verkuyl 1993: 36)

If Dowty’s or Verkuyl’s judgements are employed, it gets harder to distinguish between Accomplishments and Achievements. To distinguish these two classes, Dowty explores further diagnostic tests concerning whether they can occur as the complement of “stop”, “finish”, “almost”, and with the adverb “deliberately”.

(31) stop

- a. Tom stopped making a chair. <Accomplishments>
- b. *Tom stopped recognising her. <Achievements>

(32) finish

- a. Tom finished making a chair. <Accomplishments>
- b. *Tom finished recognising her. <Achievements>

(33) almost

- a. Tom almost painted a picture. <Accomplishments>
- b. *Tom almost reached the station. <Achievements>

(34) deliberately

- a. Tom painted a picture deliberately. <Accomplishments>
- b. *Tom reached the station deliberately. <Achievements>

Dowty (1979) gives a list summarising the results from all the diagnostic tests.

Table 2-3 : Dowty's syntatic and semantic tests for verb class (Dowty 1979:60)

Criterion	States	Activities	Accomplishments	Achievements
1. meets non-stative tests	no	yes	yes	?
2. has habitual interpretation in simple present tense:	no	yes	yes	yes
3. ϕ for an hour, spend an hour ϕ ing:	ok	ok	ok	bad
4. ϕ in an hour, take an hour to ϕ :	bad	bad	ok	ok
5. ϕ for an hour entails ϕ at all times in the hour	yes	yes	no	d.n.a
6. x is ϕ ing entails x has ϕ ed	d.n.a	yes	no	d.n.a
7. complement of <i>stop</i> :	ok	ok	ok	bad
8. complement of <i>finish</i> :	bad	bad	o	bad
9. ambiguity with <i>almost</i> :	no	no	yes	no
10.x ϕ ed in an hour entails x was ϕ ing during that hour:	d.n.a	d.n.a	yes	no
11.occurs with <i>studiously</i> <i>attentively</i> , <i>carefully</i> , etc.	bad	ok	ok	bad

ok= the sentence is grammatical, semantically normal

bad= the sentence is ungrammatical, semantically anomalous

d.n.a= the test does not apply to verbs of this class

Dowty (1979: 71) claims that “the different aspectual properties of the various kinds of verbs can be explained by postulating a single homogeneous class of predicate— *stative predicates* — plus three or four sentential operators” - BECOME, DO, and CAUSE. According to his explanation, Statives are primitive predicates, which English stative verbs directly correspond to, while the three aspectual operators and connectives are used to construct the logical structure of other aspectual classes of verbs. That is, Vendler's (1967) four aspectual verb classes can be described as a combination of Stative predicates and aspectual operators. The logical structures of each class of verb are represented in Table 2-4.

Table 2-4: Logical Structures of Vendler's Verb Class (Van Valin 1990:224)

VERB CLASS	LOGICAL STRUCTURE
STATE	predicate' (x) or (x,y)
ACHIEVEMENT	BECOME predicate' (x) or (x,y)
ACTIVITY (=Agentive)	(DO (x))) [predicate' (x) or (x,y)]
ACCOMPLISHMENT	Φ CAUSE ψ , where Φ is normally an activity predicate and ψ an achievement predicate.

In the next section, we shall move on to Van Valin's (1990) theory of Role and Reference Grammar which uses Dowty's aspectual calculus.

2.2.2.2 The linking schema of Role and Reference Grammar and Van Valin (1990)

Role and Reference Grammar (RRG) is also based on the theory of lexical decomposition proposed in Dowty (1979). Like other syntactic theories, RRG posits a linking rule between semantic and syntactic representation, but there is one crucial difference between RRG and a number of other theories, RRG assumes only a single level of syntactic representation. Thus, it assumes a direct mapping from semantic representation (Logical Structure:LS) to the syntactic representation. RRG postulates two levels of semantic roles: one which is equivalent to the thematic relations of other theories, and another which has no exact corresponding notion in other theories.

The first tier, thematic relations, is defined according to the position of arguments in LS, which means the difference in thematic relations is to a large extent attributed to the verb class, that is to the LS. The derivation of thematic relations for state and activity verbs is illustrated in Table 2-5.

Table 2-5: Definitions of thematic relations for state and activity verbs.

(Van Valin 1990: 226)

I. STATE VERBS

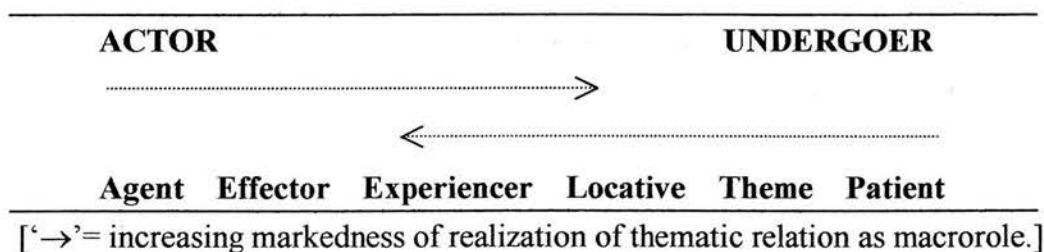
A. Locative	be-at' (x,y)	x= locative, y= theme
B. Nonlocational		
1. State or condition	predicate' (x)	x= patient
2. Perception	see' (x,y)	x= experiencer, y= theme
3. Cognition	believe' (x,y)	x= experiencer, y= theme
4. Possession	have' (x,y)	x= locative, y= theme
5. Attrib/Identificational	be' (x,y)	x= locative, y= theme

II. ACTIVITY VERBS

A. Uncontrolled	predicate' (x,(y))	x= effector (y= locative)
B. Controlled	DO (x,[predicate' (x,(y))])	x= agent, (y= locative)

With respect to the second tier, two crucial macroroles are posited: ACTOR and UNDERGOER. These are the two arguments of a transitive predication. Each of the macroroles subsumes the various thematic relations, and the relationship between the macroroles and the thematic roles is regulated by the Actor-Undergoer Hierarchy in Table 2-6.

Table 2-6: Actor-Undergoer Hierarchy. (Van Valin 1990: 226)



The Hierarchy shows an accessibility cline for each macrorole. The closer to the centre the arrows goes, the less prototypical the realisation of the thematic role as a given macrorole gets. For example, the volitional transitive verb “hit” has typical ACTOR and UNDERGOER, which are “agent” and “theme”, while the verb such as “see”, “fear”, the ACTOR is Experiencer, and the UNDERGOER is Theme, which are marked cases.

The tier of ACTOR and UNDERGOER plays a role as the interface between thematic

and grammatical relations. RRG has its own linking algorithm, which determines how to link the macroroles to grammatical relations. Van Valin suggests the RRG linking algorithm consists of two steps — the first step is the assignment of macrorole status and thematic relations to the argument, the second step is mapping the macrorole and the rest of the arguments onto the syntactic constructions. The first step is regulated by the General Macrorole Assignment Principles as follows:

(35) General Macrorole Assignment Principles:

- a. Number: the number of macroroles a verb takes is less than or equal to the number of arguments in its LS.
 - 1. If a verb has two or more arguments in its LS, it will take two macroroles.
 - 2. If a verb has one argument in its LS, it will take one macrorole.
- b. Nature: for verbs which take one macrorole
 - 1. If the verb has an activity predicate in its LS, the macrorole is actor.
 - 2. If the verbs has no activity predicate in its LS, the macrorole is undergoer.

(Van Valin 1990:227)

The second step is governed by the Pivot Hierarchy below:

(36) Pivot Accessibility Hierarchy = ACTOR> UNDERGOER> others

This hierarchy shows which role is chosen as pivot in an unmarked case. In English, the transitive construction normally chooses the actor as the subject-equivalent, with the passive construction as a marked case.

Based on the linking schema in RRG, Van Valin (1990) presents his own account of split intransitivity in Italian, Georgian and Acehnese. Let us briefly review his explanation for split intransitivity in terms of “the selection of auxiliary verbs” and NE-cliticization.

First, with respect to the selection of auxiliary verbs, Van Valin provides an account associated with the Dowty/Vendler classification of verbs, which is also suggested in Centineo (1986). That is, if the ESSERE/AVERE selection is considered in terms of the aspectual classes, it can be reduced to one generalisation –in Italian, all AVERE verbs are classified as activity verbs, and all ESSERE verbs as State, Achievement or Accomplishments. In the RRG framework, activity verbs are labelled class-SA, and

the latter verbs (State, or Achievement, or Accomplishment) are named class-So. Combining these concept with the Logical structure of each aspect class shown in Table 2-7, it is presented as follows:

**Table 2-7: Logical structures of class-SA and class-So intransitive verbs in Italian
(based on Van Valin 1990:233)**

	VERB CLASS	LOGICAL STRUCTURE
<AVERE verbs> Class-SA:	ACTIVITY (=Agentive)	(DO (x))) [predicate' (x) or (x,y)]
<ESSERE verbs> Class-So:	STATE	predicate' (x) or (x,y)
	ACHIEVEMENT	BECOME predicate' (x) or (x,y)
	ACCOMPLISHMENT	Φ CAUSE ψ , where Φ is normally an activity predicate and ψ an achievement predicate.

This logical structure clearly shows one common feature seen among ESSERE (class-So) verbs— each class among State, Achievement and Accomplishment entails a state predicate in its logical structure. Van Valin (1990:233) presents this fact as the rule of auxiliary selection:

- (37) **AUXILIARY SELECTION WITH INTRANSITIVE VERBS:** Select *essere* if the LS of the verb contains a state predicate.
- (38) **NE-CLITICIZATION:** *NE* realizes the lowest-ranking argument on the Actor-Undergoer hierarchy in the state predicate in the LS of the predicate in the clause.

Van Valin suggests that both rules show that the existence of the state predicate is the key for ESSERE verbs. Synthesizing all his accounts, it is possible to draw a generalisation about auxiliaries in this way; AVERE verbs are classified as activity verbs, which have an actor as pivot, while ESSERE verbs are categorised as either state, or achievement, accomplishment, which have an undergoer as Pivot.

2.2.2.3 Dowty (1991)

2.2.2.3.1 Proto-roles and argument selection

Dowty (1991) claims that the traditional system of discrete thematic roles in GB theory

cannot describe the characteristics of verbal arguments well, because he believes that thematic roles are not discrete entities but cluster concepts, much like the notion of “prototypes” presented by Rosch and Mervis (1975). This is a new view on thematic roles, which completely differs from the one presented in Dowty (1979). Thus he posits two prototypes of roles: Proto-Agent and Proto-Patient, each of which consists of a cluster of semantic entailments, and explains that each argument differs in the degree of the entailment which it denotes. These two prototype roles seem to be similar to the two “macroroles”, ACTOR and UNDERGOER, proposed by Foley and Van Valin (1984). Dowty, however, argues that macroroles and Proto-roles are not identical, because the former are posited as two discrete categories, while the latter are as cluster concepts, which are fuzzy. His emphasis is that each Proto-role consists of a set of semantic entailments, and “there are DEGREES of membership in the two P[Proto]-categories” (Dowty 1991:599). He gives a list of entailments which characterise the two role types as follows:

(39) Contributing properties for the Agent Proto-Role:

- a. volitional involvement in the event or state
- b. sentence (and/or perception)
- c. causing an event or change of state in another participant
- d. movement (relative to the position of another participant)
- (e.exists independently of the event named by the verb)

(40) Contributing properties for the Patient Proto-Role:

- a. undergoes change of state
- b. incremental theme
- c. causally affected by another participant
- d. stationary relative to movement of another participant
- (e.does not exist independently of the event, or not at all)

(Dowty 1991: 572)

Dowty states that each of the properties in the role is semantically independent, even though each argument in most English transitive verbs entails more than one property. Dowty argues that Proto-roles reflect higher order generalisations about lexical meanings. That is, the more entailments a verb has belonging to either Agent or Patient proto-roles, the more centrally it represents the category. His algorithm for argument selection is regulated by an Argument Selection Principle and two Corollaries as follows:

- (41) ARGUMENT SELECTION PRINCIPLE:** In predicates with grammatical subject and object, the argument for which the predicate entails the greatest number of Proto-Agent properties will be lexicalized as the subject of the predicate; the argument having the greatest number of Proto-Patient entailments will be lexicalized as the direct object.
- (42) COROLLARY 1:** If two arguments of a relation have (approximately) equal numbers of entailed Proto-Agent and Proto-Patient properties, then either or both may be lexicalized as the subject (and similarly for objects).
- (43) COROLLARY 2:** With a three-place predicate, the nonsubject argument having the greater number of entailed Proto-Patient properties will be lexicalized as the direct object and the nonsubject argument having fewer entailed Proto-Patient properties will be lexicalized as an oblique or prepositional object (and if two nonsubject arguments have approximately equal numbers of entailed P-Patient properties, either or both may be lexicalised as direct object)
- (44) NONDISCRETENESS:** Proto-roles, obviously do not classify arguments exhaustively (some arguments have neither role) or uniquely (some arguments may share the same role) or discretely (some arguments could qualify partially but equally for both proto-roles) (Dowty 1991: 576)

Dowty warns that, in spite of using the term “argument selection”, he does not mean to use the term “selection” in the sense used in the GB framework meaning “a step that occurs during the derivation of a sentence...or linking-up two different levels of representation, the syntactic level and the ‘thematic level’ (Dowty 1991:576). Rather, he uses the term “argument selection” to indicate a constraint on what sort of predicates will exist in a natural language out of the number of predicates which can be predicted.

With these notions of Proto-Agent and Proto-Patient, Dowty gives an account of the distinction between unaccusatives and unergatives. His claim is summarised into the following two points:

- (a) The unaccusative-unergative distinction can be characterised with two categories of arguments: Proto-Agents and Proto-Patients.
- (b) The unaccusative-unergative distinction across languages can be explained by the Argument Selection Principle as shown in (41).

As referred to in (b), Dowty attempts to give a proper account of the variation in the

unaccusativity-unergative distinction across languages. More concretely, he explains how unaccusativity is defined in terms of the Proto-role hypothesis as follows:

....in any language which manifests unaccusativity, predicates that are ‘high’ in agentivity AND ‘low’ in patient properties are invariably unergative, while those low in agent properties and high in patient properties are invariably unaccusative; only those high in both kinds of entailments, or low in both, should be unstable.

(Dowty 1991: 608)

Dowty’s use of cluster concept seem to succeed in giving a solution for unaccusative mismatches, but in fact, there are some scholars who have identified problems with it. We shall briefly look at them.

2.2.2.3.2 Some criticisms of Dowty’s Proto-role theory

Levin and Rappaport Hovav (1995) evaluate Dowty’s Proto-role theory admitting that the idea of Proto-roles as cluster concepts is valid. However, they point out at the same time that there is still some vagueness in the definition of the entities. Sorace (2000:16) argues that the idea of two cluster concepts is difficult to substantiate empirically in the following ways:

- (a) which verbs would be characterised by a high, or by a low, number of both agent and patient entailments?
- (b) Are there verbs with two maximally agent like, or two maximally patient like properties?

In addition, Juffs (1996:45) raises another question for Dowty’s approach, which is that Dowty implies that the entailments are stored, but does not make clear “in what form are these entailments stored”. Grimshaw (1990:31) warns that “it is undesirable to posit a probabilistic theory such as Dowty’s because some of the restrictions are absolute and can *never* be overridden”. She also adds that there is a reason why Dowty’s approach succeeds in providing an account of argument realisation—only properties which are thematically the most prominent arguments and the ones which are aspectually the most prominent arguments are included in his lists.

2.2.2.4 Summary of the semantic approach

In this section, studies by Van Valin (1990) and Dowty (1991) in the purely semantic approach have been reviewed. Although these studies were developed with insight from each other's previous work, and have a lot of similarities, there are great differences in some respects (ex. the concept of thematic roles).

The purely semantic approach claims that the two classes of intransitive verbs can be distinctively characterised in semantic terms. It completely denies and excludes any manifestation of split intransitivity in syntactic representation.

2.2.3 The interface approach

The interface approach treats unaccusativity as a phenomenon which is associated with the domains of both syntax and semantics. A number of theories which take up this position have been presented. These theories are comparable in that they attempt to account for the correlation between syntax and semantics in a systematic manner, but differ considerably in their details.

In this section, five theories by different scholars (Levin and Rappaport Hovav 1995; Sorace 2000; McClure 1995; Borer 1994; van Hout 1994, 1996) will be reviewed, which can be mainly categorised into two different approaches: the lexical semantic approach and the predicate-based approach. Levin and Rappaport Hovav (1995) and Sorace (2000) are examples of the former, while McClure (1995), Borer (1994), and van Hout (1994, 1996) count among the latter.

These theories differ in many respects, but the main differences can be characterised as two sets of parameters, presented by Benua and Borer (1996), and defined as follows by Arad (1996):

- (45) (i) Lexical-entry driven approaches vs. predicate-based approaches:** lexical-entry driven approaches assume that the syntax of verbs is projected from their lexical entries, and is determined by them. Lexical entries should therefore contain all the information (thematic or aspectual) needed for projecting verbs' syntax correctly (see, for example, Chomsky's 1986 Canonical Structure Realization, Baker's 1988 Uniformity of Theta Assignment Hypothesis (UTAH),

Tenny's 1992, 1994 Aspectual Interface Hypothesis, Pesetsky 1995, Levin and Rappaport Hovav 1995, Carrier and Randall 1993, Larson 1988, Grimshaw 1990). Predicate-based approaches, on the other hand, assume that at least part of the interpretation of individual arguments in the clause depends on the syntax of the entire predicate, rather than on specification of lexical entries (see Hoekstra and Mulder 1990, Borer 1994, van Hout 1996).

- (ii) **Thematically-based approaches vs. event structure-based approaches:** in thematically-based approaches, arguments are licensed by being assigned a thematic role by the verb. The set of thematic roles differs slightly according to the theory, but it generally includes Agent, Causer, Experiencer, Theme, Goal, Source, etc. All traditional approaches within GB belong to this type. In event structure-based approaches, the lexical information available at the interface is the event structure of the verb. The verb assigns aspectual roles (Tenny 1992, 1994), or specifies event participants (van Hout 1996), rather than assigning thematic roles.

(Arad 1996: 215-216)

Based on these parameters, each of the five theories can be illustrated as in Table 2-8:

Table 2-8: The categorisation of the theories based on the interface approach

	Thematically-based	Event structure-based
Lexical-entry driven	Levin and Rappaport-Hovav (1995) Sorace(2000)	Sorace(2000)
Predicate-based		McClure (1995) Borer (1994) van Hout (1994, 1996)

Table 2-8 shows a clear difference between the theories based on the lexical-entry driven approach and those based on the predicate based approach. To start with the lexical-entry driven approaches (Levin and Rappaport Hovav 1995) assume that the level of lexical representation is the most crucial, because all the necessary information for syntactic projection is included in its lexical entry. The lexical-entry driven approach posits an intermediate level of argument structure between lexical-semantic

representation and lexical-syntactic representation. Firstly, the lexical semantic specifications are mapped onto the position in argument structure such as “agent” or “patient”. Then assuming thematic hierarchies or linking rules, the arguments are projected to the syntactic position.

Let us move on to the predicate-based approach (Borer1994, McClure 1995, van Hout 1994, 1996). One of the biggest differences from the lexical-entry driven approach is that they focus on the level of the predicate which its lexical verb is embedded in rather than the lexicon itself. It posits a direct projection from aspectual/event structure onto syntax without postulating the intermediate level of argument structure.

We shall start with Levin and Rappaport Hovav’s lexical-entry driven approach.

2.2.3.1 The lexical-entry driven approach

2.2.3.1.1 Levin and Rappaport Hovav (1995)

Based on Perlmutter’s hypothesis that “unaccusative is syntactically represented but semantically determined”, Levin and Rappaport Hovav (1995) examine which semantic classes of intransitive verbs are syntactically encoded as unaccusatives. Firstly, Levin and Rappaport Hovav discuss the validity of three possible diagnostic tests for unaccusativity in English: the resultative construction, the causative alternation, and the locative construction. They present the first and the second diagnostic tests as a test of *deep* unaccusativity, and the third one as a test of *surface* unaccusativity. Let us have a brief review for each diagnostic test here.

a. The resultative construction

Levin and Rappaport Hovav (1995) introduce the resultative construction as a test of deep unaccusativity. Consider the following examples.

- (46) a. He broke the vase into pieces.
b. The vase broke into pieces.
- (47) a. John painted the car red.
b. The car was painted red.

- (48) a. * He broke the vase tired.
b. * John painted the car tired.

Simpson (1983) notes that a resultative phrase may only modify an internal argument of the verb. In (46), the resultative phrase “into pieces” modifies the internal argument “the vase”. In the same way, (47a) means “he painted the car, as a result the car became red”. However, in (48a) and (48b), the resultative phrase “tired” cannot modify the external argument of the verb “he”, “John”, in other words, it cannot be interpreted as being predicated of the subject. Similarly, the resultative phrase cannot modify the subject of simple intransitive verbs which have no internal argument, as shown in (49).

- (49) a. * John ran tired.
b. * John laughed tired.
c. * John danced tired.

To summarise according to McClure (1995:9),

- (50) Resultative (English)
a. Direct object
I painted the car red (= red car)
b. Passive subject
The dog was washed clean (=clean dog)
c. Unaccusative subject
The juice has frozen solid (=solid juice)

b. The causative alternation

There has been wide awareness that the causative alternation is associated with the unaccusative/unergative distinction. The causative alternation is claimed to be a valid unaccusative diagnostic test (Burzio 1986, C. Rosen 1981, among others), which is shown by the following examples:

- (51) Unaccusative
a. Pat broke the window./ The window broke.
b. Antonia opened the door./ The door opened.
c. Tracy sank the ship./ The ship sank.

(52) Unergative

- a. The children played./ * The teacher played the children.
(cf. The teacher made the children play)
 - b. The actor spoke./ * The director spoke the actor.
(cf. The director made the actor speak)
 - c. The crowd laughed./ * The comedian laughed the crowd.
(cf. The comedian made the crowd laughed)
- (Levin and Rappaport Hovav 1995:79-80)

Levin and Rappaport Hovav (1995), however, claim that the causative alternation does not apply to all the unaccusative verbs, and present some counterevidence, involving verbs of existence and appearance.

- (53) a. A star appear in the sky./ * The darkness appeared a star in the sky.
b. An explosion occurred./ * The gas leak occurred an explosion.
c. A solution exists./ * The mathematician existed a solution.

(Levin and Rappaport Hovav 1995:122)

Thus, Levin and Rappaport Hovav (1995) do not regard the causative alternation as a valid diagnostic test for unaccusativity, because not all unaccusative verbs are attested in the alternation.

c. Locative inversion

It has been acknowledged that locative inversion is a diagnostic test for surface unaccusativity (Bresnan and Kanerva 1989, Coopmans 1989 supported by Mulder 1990, L. Levin 1986, among others), which is shown by the following examples:

(54) Unergative

- a. Many students talk in the library.
- b. *In the library talk many students.

(55) Unaccusative

- a. The head of Jenny's mother appeared over her shoulder.
- b. Over her shoulder APPEARED the head of Jenny's mother.

[M. Spark, *The Prime of Miss Jean Brodie* 27]

(Levin and Rappaport Hovav 1995:220)

Levin and Rappaport Hovav, however, raise two points. Firstly, not all unaccusative verbs are attested in the locative inversion construction, but only some cases of unaccusative verbs fit naturally with it: verbs of appearance and existence as in (55), while unaccusative verbs of change of state are not found in it, for example,

(56) a. *On the top floor of the skyscraper BROKE many windows.

b. *On the streets of Chicago MELTED a lot of snow.

c. *On the backyard clotheslines DRIED the weekly washing.

(Levin and Rappaport Hovav 1995:224)

Secondly, Levin and Rappaport Hovav point out that some unergative verbs can also be used with locative inversion. Look at the following examples:

(57) a. Opposite the landing-place stood half a dozen donkeys with saddles on their backs and bunches of flowers in their bridles, and around them CHATTERED and SANG as many girls with the silver spadella stuck through their black tresses and a red handkerchief tied across their shoulders [A. Munthe, *The Story of Sam Mitchele*, 1]

b. On the third floor WORKED two young women called Maryanne Thomson and Ava Brent, who ran the audio library and print room. [L. Colwin, *Goodbye without Leaving*, 54]

c. Behind the wheel LOUNGED a man uniformed with distinct nautical flavour.
[A. W. Upfield, *The Windows of Bloome*, 109]

d. At one end, in crude bunks, SLEPT Jed and Henry...
[L. Broomfield, *The Farm*, 18]

e. He thought of the free-form pool behind the bougainvillea hedge there clogged with rafts of Styrofoam on which DOZED naked oily bathers lying on their backs wide open to that sun. [A. Marshall, *The Brass Bed*, 228]

(Levin and Rappaport Hovav 1995:224)

They explain that this is because the locative inversion requires the verb to fulfil a discourse function as “informationally light”, and some unergative verbs can satisfy this requirement as shown in (57).

To sum up Levin and Rappaport Hovav's view on these diagnostic tests, they argue that only the resultative construction has validity as a diagnostic test while the causative alternation and the locative inversion construction do not.

The results from their analysis are summarised as follows:

(58) Syntactically unaccusative in English:

- (i) externally caused verbs (*break, open, sink*)
(e.g. *The window broke, The ship sank*).
- (ii) verbs of inherently directed motion (*arrive, come, leave*)
(e.g. *We arrived at the hotel, He came to my house*)
- (iii) verbs of existence and appearance (*appear, remain, exist*)
(e.g. *A man appeared in the doorway, This kind of bird exists only in Scotland*)

(59) Syntactically unergative in English:

- (i) internally caused verbs (*laugh, smile, joke, travel*)
(e.g. *The children laughed, She smiled*)
- (ii) verbs of emission (ex. *wheeze, flash, shine, sparkle*)
(e.g. *The jewels sparkled, Her eyes shone*)
- (iii) verbs of spatial configuration in their 'maintain position' sense (*sit, stand, lean*).
(e.g. *The statue stands in the park, My house sits at the foot of the hill*)

There are a number of verbs which do not fall within any of the semantic classes above. These verbs exhibit a shift between unaccusative and unergative depending on the non-agentive and the agentive use:

- (60) (i) internally caused verbs of change of state (*bloom, flourish, decay, rot*)
(e.g. *The cherry blossoms bloom, The logs decayed*)
- (ii) some non-agentive manner of motion verbs (*roll, spin, bounce*)
(e.g. *The ball bounced, The ball rolled*)

Levin and Rappaport Hovav formulate four main linking rules to explain how the lexical syntactic representation is derived from its lexical semantic representation—the Immediate Cause Linking Rule, the Directed Change Linking Rule, the Existence Linking Rule, and the Default Linking Rule. The linking rules determine how the lexical-semantic specifications are mapped onto argument structure positions like

“external argument” and “direct internal argument”³. These argument structures are projected into syntactic configuration by the Projection Principles. Consequently, linking rules are responsible for creating the lexical syntactic representation from its lexical semantic representation. The interface between semantic representation and the syntactic representation can be illustrated as follows:

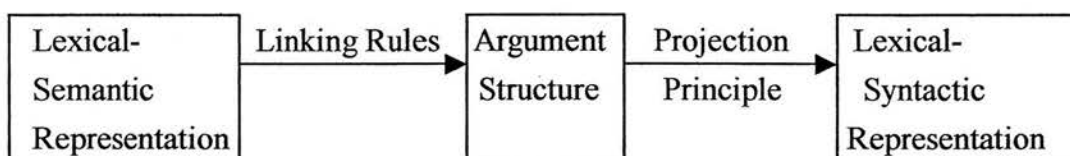


Figure 2-1: The Interface Model

Let us start with the Immediate Cause Linking Rule.

2.2.3.1.1.1 The immediate Cause Linking Rule

(61) Immediate Cause Linking Rule

The argument of a verb that denotes the immediate cause of the eventuality described by that verb is its external argument.

Levin and Rappaport Hovav point out that the best notion to distinguish between the intransitive verbs which have transitive causative uses (ex. *break, open*), and the ones which do not (ex. *laugh, speak*), is that of internal versus external causation. The Immediate Cause Linking Rule is devised to apply to both internally and externally caused verbs. It is responsible for the mapping of the external argument, specifying that the immediate cause will be projected into the external argument position. Look at the following examples:

- (62) a. Pat broke the window.
b. The window broke.

(Levin and Rappaport Hovav 1995: 79)

³ Marantz (1984) further divides *internal arguments* into *direct* and *indirect arguments*. A *direct internal argument* is realised as an argument in direct object position; an *indirect internal argument* occurs as an argument in oblique position. However, since VP-Internal Subject Hypothesis (Fukui 1986) was presented, the distinction between *external/internal argument* has been in controversy. The definition of *external argument* changes depending on whether this hypothesis is employed.

- (63) a. The crowd laughed.
 b. *The comedian laughed the crowd.

(Levin and Rappaport Hovav 1995: 80)

The terminology, “immediate cause” used in the rule refers to participants like “Pat”, “the crowd” in (62), and (63), respectively, which is the entity responsible for bringing about the eventuality. Since verbs like “break” denote external causation, where immediate cause and *theme*⁴ are necessarily different, they allow transitive causative uses, whereas verbs like “laugh” describe internally caused eventualities, where immediate cause and *theme* are the same, so they do not have transitive causative uses as (63b). This leads to the fact that internally caused verbs are basically monadic, and externally caused verbs are basically dyadic no matter which framework they are embedded in.

The Immediate Cause Linking Rule also explains why “verbs of emission” displays different syntactic behaviour in the causative alternation depending on context, as seen in (64) and (65).

- (64) a. The doorbell buzzed.
 b. The postman buzzed the doorbell.

- (65) a. The bees buzzed.
 b. *The postman buzzed the bees.

(Levin and Lappaport Hovav 1995: 117)

For the internally caused use of “buzz” in (64a), (65a), there is no problem in conceptualising both entities as emitting the sound. However, for the externally caused use of “buzz”, (65b) is not allowed, because bees emit the sound under their own control, and nobody can make them emit the sound under manipulation. As a result, it is impossible to have a transitive causative use in this context.

⁴ Anderson (1977:367) defines *theme* as the entity that is affected by being moved or changed as a result of the action described.

2.2.3.1.1.2 The Directed Change Linking Rule

(66) Directed Change Linking Rule

The argument of a verb that corresponds to the entity undergoing the directed change described by that verb is its direct internal argument.

The Directed Change Linking Rule is formulated for verbs of change of state and verbs of inherently directed motion, in order to specify that each of the passive participants such as “patient”, “theme” will be mapped onto the direct internal argument position as seen in (67) and (68).

- (67) a. The boy broke the window.
b. The window broke.

- (68) a. Mike opened the door.
b. The door opened.

In English, a subject is obligatory at S-structure, and as a result of the application of syntactic principles like the Case Filter, Burzio’s Generalisation, and the Projection Principle, the direct internal argument moves into subject position at S-structure.

The crucial characteristic of those verbs which the Directed Change Linking Rule applies to is “directed”. Verbs which denote a “manner of motion” but not a “direction” like *walk*, *swim*, and *bounce* are excluded for the scope of the Directed Change Linking Rule, and fall under the Immediate Cause Linking Rule, though they inherently entail a sort of change of location.

2.2.3.1.1.3 The Existence Linking Rule

(69) Existence Linking Rule

The argument of a verb whose existence is asserted or denied is its direct internal argument.

The Existence Linking Rule is specially formulated for verbs of existence and appearance. Look at the examples.

- (70) a. A star appeared in the sky.
b. A solution exists.

(Levin and Rappaport Hovav 1995:122)

These classes of verbs are syntactically encoded as unaccusative due to their behaviour as seen in “*there*-insertion” as shown in (71), but they lack an external cause parallel to those internally caused verbs classified as unergative.

- (71) a. There appeared a ship on the horizon.
b. There exists a solution to that problem.

(Levin and Rappaport Hovav 1995:121)

Levin and Rappaport Hovav (1995) conclude that the notion of internal versus external causation is not suitable for this class of verbs, and establish a special linking rule for their classification.

2.2.3.1.1.4 The Default Linking Rule

(72) Default Linking Rule

An argument of a verb that does not fall under the scope of any of the other linking rules is its direct internal argument.

The Default Linking Rule is created for monadic verbs which the other three linking rules do not account for. Levin and Rappaport Hovav assume that this rule will apply to a part of the verbs of manner of motion, which are usually non-agentive, such as *bounce*, *roll*, and *spin*. They take the *roll* verbs as an examples, and explain that the Directed Change Linking Rule cannot be applied to the *roll* verbs when they are used as an externally caused verb, because they are not directed. In such cases, the Default Linking Rule is applied to the verbs.

2.2.3.1.1.5 The Order of Priority among the Linking Rules

Levin and Rappaport Hovav (1995) admit that there still remain some questions about the rules such as whether they are all necessary or if there is any order of priority among them. In fact, there are some cases where one identical verb can be subject to two

different linking rules. For example, the internally caused verbs of “directed change” fall under not only “the Directed Change Linking Rule”, but also “the Immediate Cause Linking Rules”. As a solution to maintain consistency in the syntactic behaviour of unaccusativity in English, Levin and Rappaport Hovav set up a priority rule which states that the Directed Change Linking Rule takes precedence over the Immediate Cause Linking Rule. Similarly, verbs of existence are subject to both of the rules, the Immediate Cause Linking Rule and the Existence Linking Rule. Levin and Rappaport Hovav posit a rule here as well, which states that the Existence Linking Rule takes precedence over the Immediate Cause Linking Rule. Thus both the Existence Linking Rule and the Directed Change Linking Rule take precedence over the Immediate Caused Linking Rule. However, Levin and Rappaport Hovav do give an order of priority between the Directed Change Linking Rule and the Existence Linking Rule.

2.2.3.1.1.6 Some criticisms of Levin and Rappaport Hovav (1995) by Sorace (2000)

a. Linking rules

Contrary to the claim of Levin and Rappaport Hovav (1995), Sorace (2000) argues that the four linking rules do not have equal importance, and they are not all equally necessary. Her criticism of the linking rules presented by Levin and Rappaport Hovav is mainly focused on the following two points:

- (73) a. The lack of explanation for the basis of the order of priority.
- b. The necessity of two rules, which overlap in classes of verbs such as verbs of appearance: the Directed Change Role and the Existence Rule.

With respect to the first point, Sorace shows that there are exceptions in several languages, which the Directed Change and Existence Linking Rules do not apply to. Look at the following examples.

- (74) a. Il poeta Omero è / *ha realmente esistito
- b. De dichter Homerus *is / heeft echt bestaan
- c. Le poète Homère *est/ a réellement existé
- d. Der Dichter Homer *ist/hat wirklich existiert

The poet Homer is/has really existed

The poet Homer really existed

(Sorace 1998 ms: 9)

As observed in the Italian example (74a), the Existence Linking Rule applies to a verb of existence and ensures its unaccusative status, but in Dutch (74b), French (74c), or German (74d), this type of verb is not unaccusative but unergative, because the arguments of verbs denoting “existence” are mapped not onto internal arguments but onto external arguments.

The second point raises the question about whether the Directed Change Rule and the Existence Rule are both necessary, even if they overlap with verbs of appearance. Along with this question, the necessity of a Default Linking Rule is cast into doubt as well; Sorace claims that if Levin and Rappaport Hovav employed the notion of “telicity”, the unergative/unaccusative shift displayed in verbs such as *run* and *roll* could be explained without postulating a distinct Default Linking Rule, because these verbs show sensitivity to the telicity of the predicate as unaccusative, which is contrary to Levin and Rappaport Hovav’s view on these verbs’ behaviour as unsystematic.

Look at the Italian examples.

- (75) a. Maria ha corso velocemente
 Maria has run quickly
 ‘Maria ran quickly’
 b. Maria è corsa a casa
 Maria is run to – home
 ‘Maria ran home’
- (76) a. La palla ha rotolato velocemente
 The ball has rolled quickly
 ‘The ball rolled quickly’
 b. La palla è rotolata nel fossato
 ‘*The ball is rolled in-the ditch*’
 ‘The ball rolled into the ditch’

(Sorace 1998 ms:10)

As shown in (75a) and (76a), verbs such as *run* and *roll* are in atelic predicates which take the auxiliary *avere*, while once a directional phrase is attached, they display unaccusative status taking the auxiliary *essere*. This also applies to Dutch as seen in (77) and (78).

- (77) a. Anneke heft in een opera gedanst
 A. has in an opera danced
 'A. danced in an opera'
- b. Anneke is van het podium of gedanst
 A. is of the stage off danced
 'A. danced off the stage'
- (78) a. De tennisbal heft over de baan gerold
 the tennis-ball has over the court rolled
 'The tennis ball rolled over the court'
- b. De tennisbal is de baan op gerold
 the tennis-ball is the court onto rolled
 'The tennis ball rolled onto the court.'

(van Hout 1996:63)

b. Semantic factors

Sorace (2000) carefully examines three semantic factors which are given by Levin and Rappaport Hovav as the relevant components for split intransitivity: *internal causation*, *directed change*, and *appearance/existence*, as well as scrutinising the notions of *agentivity*, *telicity*, and *stativity*, which are regarded as irrelevant by Levin and Rappaport Hovav. Comparing the components of agentivity and internal causation, telicity and directed change, Sorace points out that in both components, Levin and Rappaport Hovav have a too broad notion in each pair. More concretely, internal causation encompasses the notion of agentivity, which means that internally caused verbs are not necessarily agentive. To take verbs of emission an example, *shine*, *flash* are internally caused but they are not agentive.

With respect to telicity, Sorace provides a similar criticism. The component of directed change encompasses that of telicity, therefore telicity always implies a directed change, but not vice versa. Sorace gives the examples of the verbs, *rise* and *cool*, which denote directed change, but not definite end-points.

Finally, Sorace posits a different view of stativity from that of Levin and Rappaport Hovav's – suppose stativity were a determinant of unaccusativity, there should not exist classes of unergative stative verbs such as verbs of emission, and the classes of unaccusative activity verbs such as verbs of spatial configuration in the

maintain-position sense as shown in (79a) and (79b), respectively.

- (79) a. The headlight flashed.
b. The computer sits on the desk.

Sorace makes the point that these two classes are both ‘stative’, but this does not mean they are stative in the same sense. She describes these verb classes that emission verbs as activity verbs which denote continuous events. In contrast, maintain-position verbs denote the continuation of a pre-existing state, and their lexical semantics includes a stative component, which differentiates them from activity verbs.

c. Diagnostics

Recall that Levin and Rappaport Hovav introduce two potential diagnostic tests for unaccusativity in English: the resultative construction and the locative inversion construction (see section 2.2.3.1.1 for details).

- (80) resultative construction
a. *John ran tired (unergative)
b. The vase broke into pieces (unaccusative)
- (81) locative inversion
a. Over her shoulder APPEARED the head of Jenny’s mother.
[M. Spark, *The Prime of Miss Jean Brodie* 27]
(Levin and Rappaport Hovav 1995:220)
b. *In the cafes of Paris TALK many artists.
(Levin and Rappaport Hovav 1995:222)

They present the former as a test of deep unaccusativity, and the latter as a test of surface unaccusativity. Having examined each diagnostic, they make the claim that the resultative construction has validity as a diagnostic test, while the locative inversion construction does not. As the main reasons for the lack of invalidity of the locative inversion, Levin and Rappaport Hovav raises two points. Firstly, not all unaccusative verbs are attested in the locative inversion construction, but only some classes of unaccusative verbs fit naturally with it: verbs of appearance and existence, while unaccusative verbs of change of state are not found in it. Secondly, some unergative verbs can also fit into the locative inversion. They explain that this is because the locative inversion requires the verb to fulfil a discourse function as “informationally

light”, and some unergative verbs can satisfy this requirement, like verbs of appearance and existence.

2.2.3.1.2 Sorace (2000)

As referred to in section 2.3, Sorace (2000) is also based on the lexical-entry driven approach. However, what distinguishes Sorace’s view from Levin and Rappaport Hovav’s is that she does not deny the idea proposed in predicate-based approaches — unaccusativity can be compositional. Sorace’s claim is that unaccusativity at its *core* is lexical, which is evidenced by the fact that core unaccusative verbs do not exhibit the syntactic shift between unaccusative/unergative even when they are embedded in an atelic predicate. Look at the following examples:

(82) Italian core verb

- a. Si è appena arrivati
SI is just arrived (pl)
“We have just arrived” (Burzio 1986:55)
- b. Sono arrivati ospiti per ore e ore
are arrived guests for hours and hours
“Guests arrived for hours”

(Sorace 2000:864)

(83) German core verb

- a. Ich bin gerade im Hotel angekommen
I am just at the hotel arrived
“I have just arrived at hotel”
- b. Gäste sind stundenlang angekommen
guests are hours long arrived
“Guests arrived for hours”

In contrast, non-core unaccusative and unergative verbs are sensitive to the aspectual characteristics of the predicate, and more likely to participate in such shifts as shown in the following examples:

(84) Dutch

- a. De tennisbal heeft over de baan gerold
the tennis-ball has over the court rolled
'The tennis ball rolled over the court'
- b. De tennisbal is de baan op gerold
the tennis-ball is the court onto rolled
'The tennis ball rolled onto the court.'

(van Hout 1996:63)

(85) Italian

- a. La palla ha rotolato velocemente
The ball has rolled quickly
'The ball rolled quickly'
- b. La palla è rotolata nel fossato
The ball is rolled in-the ditch
'The ball rolled into the ditch'

(Sorace 1998ms:10)

Thus, Sorace introduces a new concept, which she calls “gradient effects” on the syntax of unaccusativity/unergativity, which can explain why some variance in the syntactic status of a verb as unaccusative or unergative may occur across languages. The crucial idea in her theory is that the unaccusative/unergative distinction is characterized by gradience which defines a hierarchy: the Split Intransitivity Hierarchy. The verbs placed higher in the hierarchy show the strongest association with the syntax of unaccusatives or unergatives. The closer we get to the periphery, the weaker the association becomes. The components of meaning which make up the hierarchies are identified not only with lexical-semantic properties of verbs but also with aspectual properties of verbs. The labels for the aspectual classes differ among linguists (ex. Pustejovsky 1988; Grimshaw 1990), but Sorace specifies several lexical-semantic components which can also be compatible with the event structures conceptualised as two definite aspectual sub-events: activity and transition/state. Those verbs with “activity” aspectual properties are generally characterised as unergative, while the verbs with “transition/state” aspectual properties are identified as unaccusative. Each of the hierarchies is elaborated as follows:

Table 2-9: The Split Intransitivity Hierarchy: unaccusatives

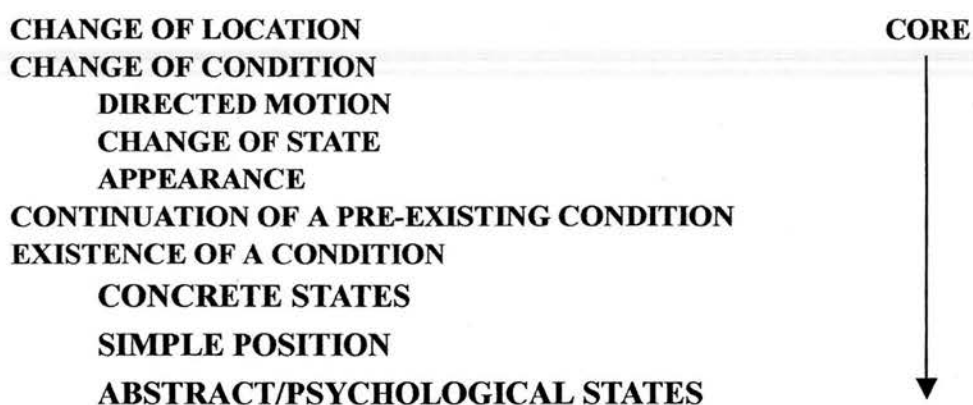
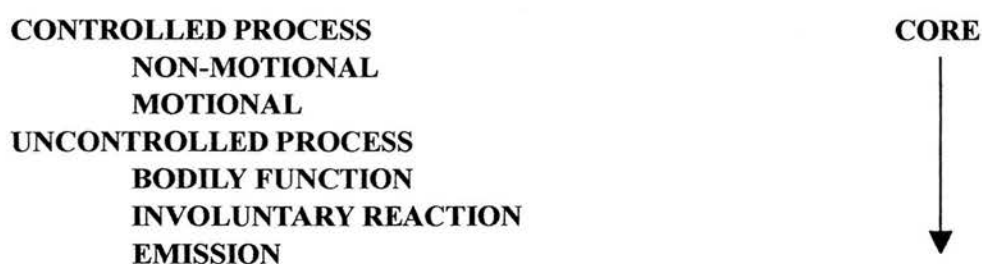


Table 2- 10: The Split Intransitivity Hierarchy: unergatives



These systematised hierarchies are striking in many respects, three of which will be examined here. Firstly, these hierarchies are based on data from five Western European languages: Dutch, English, French, German, and Italian, and were explicitly developed with a view to application to other languages as well. This is a new step in the sense that, previously, up till now there had been no classification of verb types appropriate for cross-linguistic application.

Secondly, these hierarchies can be used to explain why “unaccusative mismatches” phenomena occur within and across languages. This approach provides us with a different point of view from existing ones. As an explanation for variation in unaccusativity within languages, Sorace points out that it is a wrong presumption which led to the concept of “unaccusative mismatches”— unaccusatives and unergatives belong to distinct homogeneous semantic classes. Her claim is that a weighted system of semantic classification is more appropriate to explain the variation in the domain of unaccusativity, as mentioned before.

Regarding unaccusative mismatches across languages, she explains that the variance of mapping across languages stems from the fact that “different languages may have different cut-off points along the hierarchy” (Sorace 2000:861), which is supported by the examples from several different languages.

- (86) a. La guerra è /?ha durato a lungo
 the war is/ has lasted for long
 “The war lasted a long time” (Italian)
- b. Mes parents *sont survécus / ont survécu au tremblement de terre
 my parents are survived/ have survived to the earthquake
 “My parents survived the earthquake.” (French)
- c. Die Äpfel haben /?sind den ganzen Winter gehalten
 the apples have the whole winter lasted
 “The apples lasted the whole winter” (German)
- d. Het concert heft/ ?? is een hele tijd geduurd
 the concert has a whole time lasted
 “The concert lasted a long time.” (Dutch)
- (Sorace 2000:868)

As the examples show, auxiliary selection with continuation of condition show variation among these languages, which stems from the fact this class of verbs is positioned in peripheral on the hierarchy.

2.2.3.2 The predicate-based approaches

McClure (1995), Borer (1994), and van Hout (1994, 1996) propose similar hypotheses on mapping. Their ideas are parallel in several points: they assume a direct projection from aspectual/event structure properties onto syntactic argument positions, and define mapping as movement from the inside of VP to some specifier position. All of them posit two distinct specifier positions of functional projections, though the labels which they use are different. We shall start with a review of McClure (1993, 1995).

2.2.3.2.1 McClure (1993, 1995)

McClure (1993, 1995) assumes a mapping from inherent aspectual structure directly into a particular syntactic structure, which means different aspectual types are projected

into syntax in different ways.

McClure proposes a semantic representation for each class incorporating Dowty's aspectual calculus, which includes the BECOME, CAUSE, and DO operators, which is summarized by McClure as follows:

- (87) BECOME (α) = 1 iff $\neg \alpha$ then α
 CAUSE (α, β) = 1 iff $\neg \alpha \rightarrow \neg \beta$ (modal conditional)
 DO ($x, \alpha(x)$) \rightarrow volitional (x) (material conditional)
- (McClure 1995:81)

McClure (1995:81) disagrees with Dowty's definition of BECOME, and defines BECOME as a pair of states, the state before and the state after a point of change. Dowty's definition of CAUSE is more abstract, but McClure defines it as a connective between the activity and the outcome.

Finally, McClure points out that the DO operator conceived by Dowty mainly represents the volitionality of the subject, which makes it uncertain whether DO represents a situation or set of situations.

According to Dowty's aspectual calculus, each verb can be represented by a state and the aspectual operators, in the same way as Vendler's (1967) four aspectual verb classes can be described with them, as seen in section 2.2.2.2.

Table 2-11: Logical Structures of Vendler's Verb Class (Van Valin 1990:224)

VERB CLASS	LOGICAL STRUCTURE
STATE	predicate' (x) or (x, y)
ACHIEVEMENT	BECOME predicate' (x) or (x, y)
ACTIVITY (=Agentive)	(DO (x))) [predicate' (x) or (x, y)]
ACCOMPLISHMENT	Φ CAUSE ψ , where Φ is normally an activity predicate and ψ an achievement predicate.

However, McClure emphasises the difference between his semantic definitions for the operators and Dowty's, in the sense that McClure gives the definitions according to a

situation-based semantics, while Dowty gives the definitions based on interval semantics. Furthermore, Dowty does not give even an interval semantic definition for the DO operator, while McClure gives a situation-based definition. Here, let us look at McClure's definitions briefly.

McClure represents the single state as "s", regarding it as a basic aspectual component. States are defined as homogeneous processes without clear boundaries", which consists of the very large set of all states. Achievements; or BECOME, consist of the two states which come before and after a point of change, represented by $C = \langle ss' \rangle$. Activities are composed of a set of achievements like $P = \{ \langle ss' \rangle \langle s's'' \rangle \dots \langle s_n s_{n+1} \rangle \dots \}$. Thus Activities are characterised as open-ended chains of achievements without clear boundaries. These aspectual structures and their logical types are summarised as follows:

(88) **Aspectual structures**

states = s, a situation

achievements = $\langle ss' \rangle$

activities = $\{ \langle ss' \rangle \langle s's'' \rangle \langle s''s''' \rangle \langle s''' \dots \rangle \}$

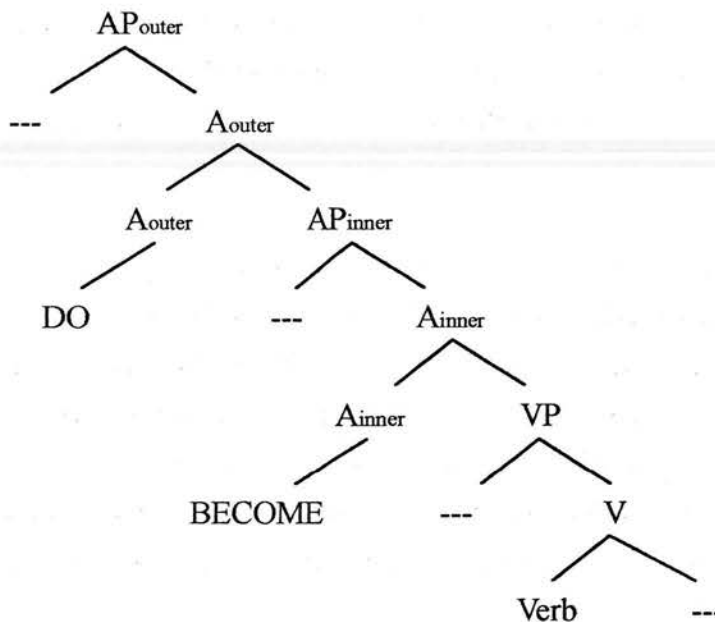
(89) **Aspectual types**

BECOME: sets of states \rightarrow sets of pairs of states

DO: sets of becomings \rightarrow sets of sets of becoming having the same protagonist
(McClure 1993:316)

In his mapping theory, these operators are projected into two syntactic aspectual functional heads labelled AP_{outer} and AP_{inner} , which come between IP and VP. DO and CAUSE operators are mapped into the head of the outer projection, while BECOME is mapped into the head of the inner projection. The general model of aspectual projection is illustrated as follows:

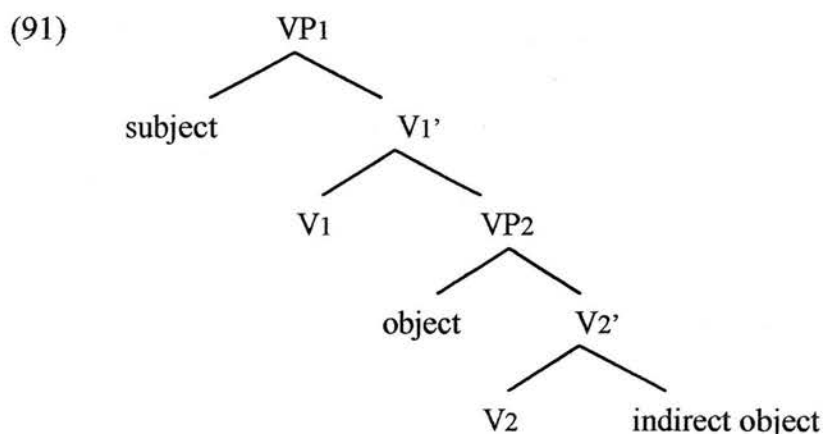
(90)



(McClure 1995: 222)

Among these operators, there are certain restrictions, which have been discussed widely in proceeding studies by Dowty (1979) et al. These restrictions are, for example, that there are cases where DO or CAUSE operate on BECOME, while there are no cases where BECOME operates on DO or CAUSE, or where DO or CAUSE operate on each other. McClure argues that his mapping theory illustrated in (90), can reduce these restrictions on the structure of aspect to general restrictions on co-occurrence in X-bar theory. That is, the standard accounts explain aspectual structure. Therefore it is not necessary to posit separate restrictions for the structure of aspect.

McClure makes some important assumptions in his mapping theory, which can be summarised in the following three points. The first assumption is that “all arguments of the verb are located within VP”(McClure, 1995: 219) at D-structure, which is based on the VP-shell Hypothesis of Larson (1988). McClure gives a VP-shell structure for ditransitive verbs as an example.



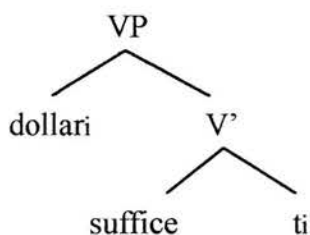
(McClure 1995: 220)

His second assumption takes up an idea from the treatment of negation in Pollock (1989) — the relevant aspectual operator is obligatory for the aspectual projections to be licensed. Thus the verbal head is regarded as an unaccomplished form of the verb before incorporating the aspectual operators via movement.

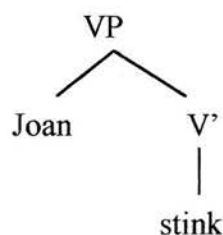
Finally, the third assumption is that θ -roles are assigned to the head's complement or specifier only. Therefore, McClure argues that every argument must be realised as low in the structure as possible, for example, subjects originate in specifier of VP for states and achievements, while subjects are realised in specifier of AP_{outer} for activities. Objects always originate in the complement position of verbs.

McClure illustrates aspectual projections for each aspectual type; Stative, Achievement, and Activity. Let us look at each aspectual type briefly.

- (92) a. Stative unaccusative
“A dollar suffices”



- b. Stative unergative
“Joan stinks”

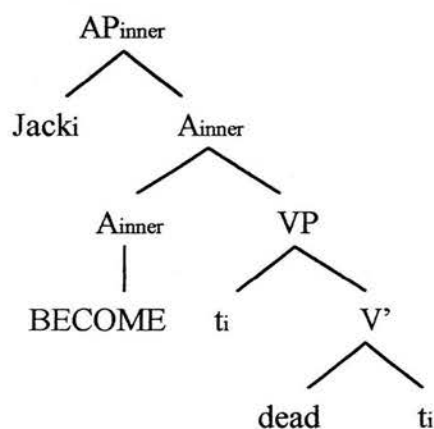


(McClure 1993: 321)

Aspectually, Statives have a simple structure, which does not need any aspectual operator to cope with. Here, McClure's view is no different from the traditional one. If the single argument originates in subject position, the structure will be unergative, while if the single argument is realised in object position, the structure will be unaccusative.

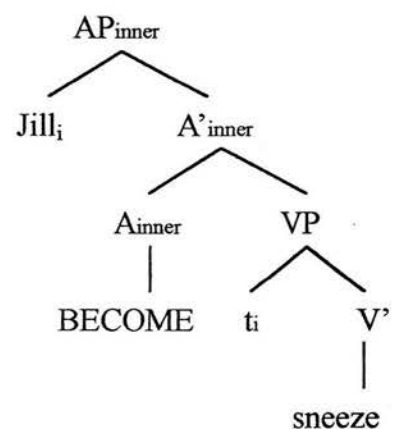
(93) a. Achievement unaccusative

"Jack died"



b. Achievement unergative

"Jill sneezed"

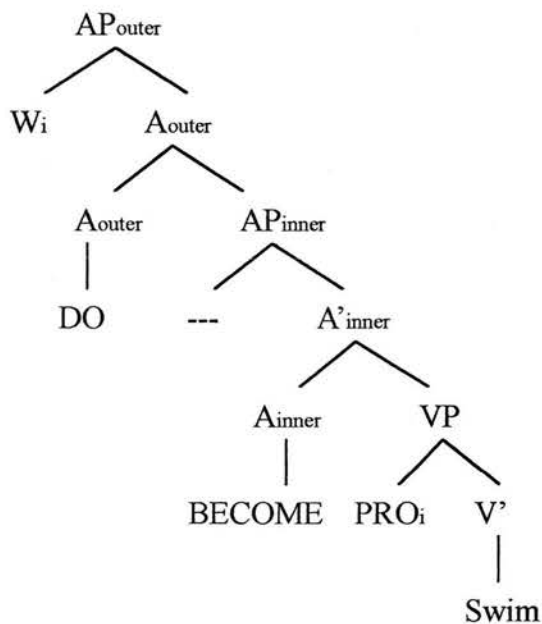


(McClure 1993: 322)

In (93a) and (93b), we see McClure's analysis of the D-structure for achievement unaccusative and achievement unergative. Both structures involve an aspectual head, which dominates the aspectual operator BECOME. In both cases, the subject must move out of VP to the non-thematically marked specifier of AP_{inner}. McClure assumes that this movement is caused by the need to get case outside VP. This is compatible with Burzio's generalisation and other related principles.

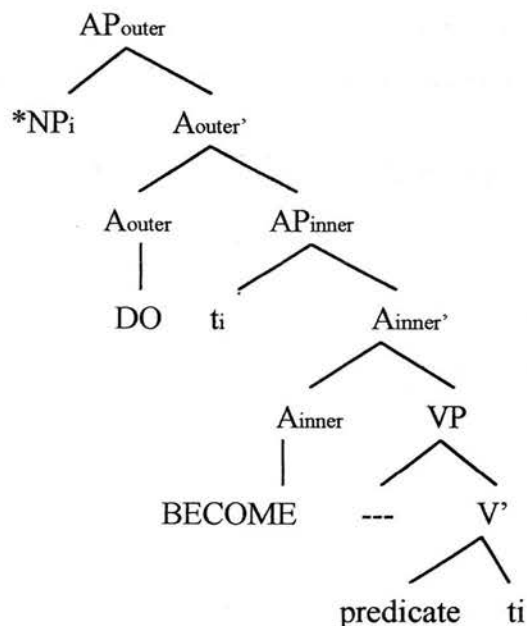
In (94a) and (94b), the single argument is raised into the specifier of AP by the BECOME operator, but the single argument in (94b) moves from the object position, which makes the sentence (94b) unaccusative, while the single argument in (94a) moves from the subject position, which makes the sentence (94a) unergative.

- (94) a. unergative Activity
“W swim[s]”



(McClure 1995: 224)

- * b. unaccusative Activity
(not possible)



(McClure 1995:237)

DO is defined as a control predicate which subcategorises between an individual who is the “Locus of Change” (i.e. the Agent) and an embedded achievement. Since it is not the verb but the DO operator which discharges a θ -role as the Locus of Change to the NP locally, this should be mapped onto the specifier position nearest to the DO operator (i.e. the specifier of AP_{outer}) at D-structure.

The reason why the structure in (94b) is not allowed can be explained by the θ -Criterion. If the Locus of Change is realised in the complement of VP, it receives a θ -role there, and it can move up to the specifier of AP_{inner} , which is not thematically marked. However, it cannot move further into the specifier of AP_{outer} , because there it would be assigned a second θ -role from the DO operator, which would violate the θ -Criterion. Discussing the projection of all aspectual types into syntactic configurations, McClure makes two crucial predictions.

- (95) 1. All intransitive activities will be unergative.
2. Only states and achievements can be unaccusative.

(McClure 1993: 320-321)

However, not all states and achievements are unaccusative. As we have already suggested above, there also exist states and achievements which are unergative. McClure suggests that these predictions have cross-linguistic validity, as witnessed by data presented from Italian, Dutch, and Japanese.

To recapitulate, McClure's model is different from other approaches which have been discussed in assuming that the interpretations of each argument are licensed by the syntactic position where it is generated. In other words, what is associated with the interpretation of argument is the syntax of the whole predicate. McClure's idea contradicts to the lexical entry driven approach which places the burden exclusively for the lexical entries.

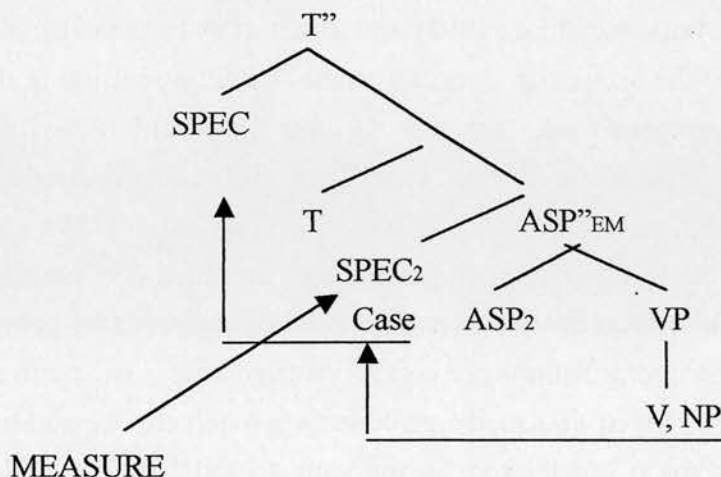
2.2.3.2.2 Borer (1994)

Borer (1994) assumes that the movement of an NP to some specifier of a functional projection results in an aspectual interpretation, which means that different aspectual interpretations are achieved through movement to the specifier position of different aspectual projections. Borer posits two distinct aspectual heads, which are AspEM and AspOR. The former stands for "aspectual event measure", which is an aspectual head dedicated to event measurement. Following Tenny (1992), Borer assumes that telic/atelic interpretation depends on whether the event is measured out or not. When a telic interpretation results, it means that the NP moves into the specifier of AspEM, and incorporates with the node MEASURE, specified as [+EM].

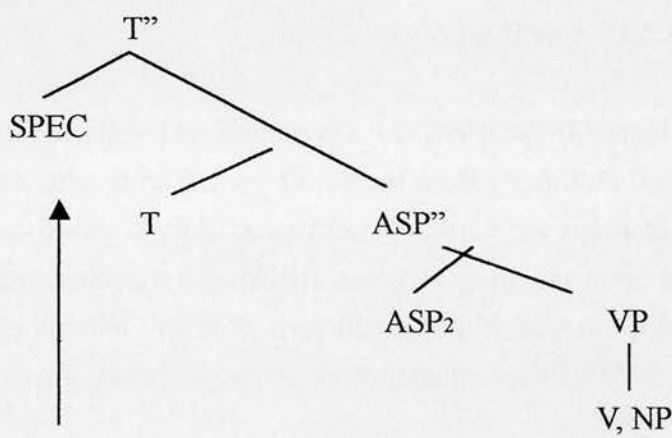
The latter, AspOR, stands for "aspectual originator", which is a higher aspectual head than AspEM. This aspectual head is associated with the interpretation of the argument as an "agent" or "originator of an event". Borer refers to ACTOR from Van Valin(1990) and PROTO-AGENT from Dowty (1991) as similar concepts.

Postulating these two aspectual nodes, Borer illustrates some derivations to show how the movement to the specifier positions of different aspectual projections result in different aspectual interpretations. Among them, we shall look at only two cases, one where the specifier of AspP is projected, and one where the specifier is not projected.

(96) a. SPEC projected, no Case assigned



b. SPEC not projected (and Case clearly unavailable)



(Borer 1994: 29)

In (96a), the specifier of AspP is projected, and must be filled. Thus NP moves into the specifier, which is specified as [+EM] entailing a telic interpretation. However, Case is not assigned here, and therefore the NP has to move on further to [SPEC, TP] to receive a nominative Case. That is, this type is identified with unaccusatives, which entail a telic interpretation with nominative Case assigned.

In (96b), the specifier of AspP is not projected, hence the NP has to move on directly to [SPEC, TP] to be assigned nominative Case. Therefore, the aspectual properties of AspEM have been deactivated, and never involved with event measurement, which never allows telic interpretation. Hence, this type has an atelic interpretation, and is characterised as unergative.

To summarise, both McClure (1995) and Borer (1994) share the same view that the interpretation of the arguments depends on the syntactic position in the predicate where the argument is generated, and they do not posit any pre-syntactic labelling of arguments, but assume two distinct specifier positions of functional projections: A_{outer} and A_{inner} for McClure (1995), A_{spEM} and A_{spOR} for Borer (1994). Their approach is different from the lexical entry driven approach in which it is suggested that individual argument is interpreted by the syntactic position where it is generated, and do not consider that the interpretations are lexically designated. The main difference between the lexical-entry driven and predicate-based approach can be summarised as follows: the former assigns a crucial role in mapping to the lexicon, while the latter to the syntactic configuration.

2.2.3.2.3 van Hout (1994, 1996)

van Hout (1994, 1996) also assumes that mapping is defined as “feature checking” rather than linking from the verb’s lexical arguments onto syntactic argument positions. She employs the idea of “event structure” proposed by Pustejovsky (1988, 1991), and claims that mapping involves checking the event structure of the whole VP predicate and not just that of the lexical verb. Before looking at Van Hout’s mapping theory, we shall briefly look at Pustejovsky’s theory of event structure.

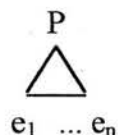
2.2.3.2.3.1 Pustejovsky’s Event structure theory

Pustejovsky (1988, 1991) assumes that aspectually different verbs are characterised as having different “event structures”, which have different combinations of sub-events. Pustejovsky posits three distinct aspectual primitives: State, Process, and Transition. He defines a *State* (S) as a single event, which is evaluated relative to no other event (ex. *be sick, love, know*); a *Process* (P) as a sequence of events identifying the same semantic expression (ex. *run, push, drag*); a *Transition* (T) as an event identifying a semantic expression, which is evaluated relative to its opposition (ex. *give, open, build, destroy*) (Pustejovsky 1991: 56). These different event types are structurally represented as follows:

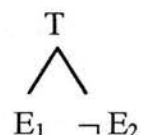
(97) a. State:



b. Process:



c. Transition:



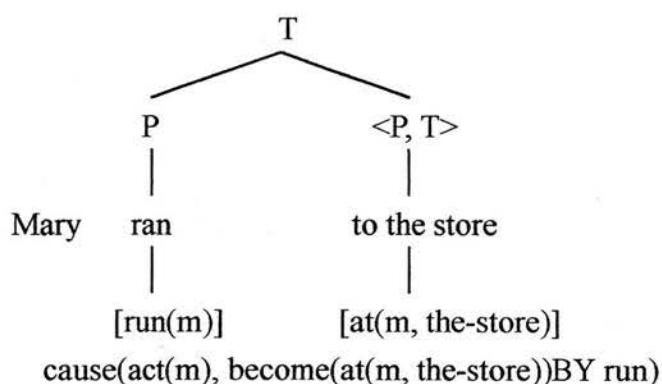
Pustejovsky defines E as a variable for any event type, which means that Transition is identified as a combination of two sub-events. For example, transitions such as “run to the store” can be decomposed into the two event types: Process and State, as illustrated below:

(98)

ES:

LCS':

LCS:



(Pustejovsky 1991: 63)

Pustejovsky explains that the verb *run* basically denotes a *process*, but the presence of a prepositional phrase (PP) brings about an event-type shifting from *process* to *transition*, because the PP *to the store* denotes the *state* of Mary being at the store, and has a function as a “delimiter” of the event. He calls the transformation from *process* to *transition*, *event composition*.

Pustejovsky (1995a) further extends the idea of event structure, and presents the Generative Lexicon Theory (GL). To put the central notion briefly, there are four basic levels of linguistic representation.

- (99) 1. **ARGUMENT STRUCTURE**: Specification of number and type of logical arguments, and how they are realised syntactically.
2. **EVENT STRUCTURE**: Definition of the event type of a lexical item and a phrase. Sorts include STATE, PROCESS, and TRANSITION, and events may have subeventual structure.

3. **QUALIA STRUCTURE:** Modes of explanation, composed of FORMAL, CONSTITUTIVE, TELIC, and AGENTIVE roles.

4. **LEXICAL INHERITANCE STRUCTURE:** Identification of how a lexical structure is related to other structures in the type lattice, and its contribution to the global organization of a lexicon.

(Pustejovsky 1995: 61, My boldtype)

The first and the second levels are the concepts which have often been discussed in the literature (Grimshaw 1990; Williams 1981; Pustejovsky 1991), and is fairly familiar, but the third level “Qualia structure” is a new notion derived from Moravcsik (1975,1990), whose idea is inspired by Aristotle’s modes of explanations (*aitiae*). Pustejovsky gives the following four aspects as the essence of a word’s meaning:

- (100) • **CONSTITUTIVE:** the relation between an object and its constituent parts;
 • **FORMAL:** that which distinguishes it within a larger domain;
 • **TELIC:** its purpose and function;
 • **AGENTIVE:** factors involved in its origin or “bringing it about”.

(Pustejovsky 1995: 76 ,my boldtype)

Pustejovsky explains that qualia structure is the central notion for the generative properties of the lexicon, because it allows us to create much more specific concepts with conjunctive properties, which is one of the main goals in GL as well: “Developing a richer, co-compositional semantic representation” (Pustejovsky 1998:293).

Pustejovsky states that there is a set of generative devices operating over the four levels of representation in (100), which provides the compositional interpretation of words in context. The crucial generative operations which he gives are as follows:

(101) • **TYPE COERCION:** where a lexical item or phrase is coerced to a semantic interpretation by a governing item in the phrase, without changing of its syntactic type.

• **SELECTIVE BINDING:** where a lexical item or phrase operates specifically on the structure of a phrase, without changing the overall type in the composition.

• **CO-COMPOSITION:** where multiple elements within a phrase behave as functors, generating new non-lexicalised senses for the words in composition.

This also includes cases of underspecified semantic forms becoming cotextually

enriched, such as *manner co-composition*, *feature transcription*.

(Pustejovsky 1995:61, my boldtype)

The third type of semantic transformation is closely related to the account of the unaccusative/unergative shift. We shall look at it in detail later.

Within the framework of GL, Pustejovsky and Busa (1995) give an account of unaccusative/unergative alternations in a single predicate. Their claim is that the relatedness of the causative/inchoative alternation or the unaccusative/unergative alternation of the same predicate cannot be captured by describing the behaviour of unaccusatives simply in terms of lexically determined verb classes. Their proposal is to regard these alternations as a kind of logical polysemy – “the ability of a lexical item to shift its meaning in context”. Based on this idea, two different constructions in causative/inchoative alternation are assumed to be derived from the same lexical representation. More specifically, Pustejovsky (1988) and Chierchia (1989) argue that unaccusatives (inchoatives) are causatives.

The crucial notion in explaining how two distinct surface forms are derived from the same semantic representation is “event headedness”. (Pustejovsky 1988, 1995). Pustejovsky defines “head” as “the most prominent subevent in the event structure of a predicate, which contributes to the ‘focus’ of the interpretations”, and also explains that “headedness is a property of all event sorts, but acts to distinguish the set of transitions, specifying what part of the matrix event is being focused by the lexical item selected” (Pustejovsky and Busa 1995: 164).

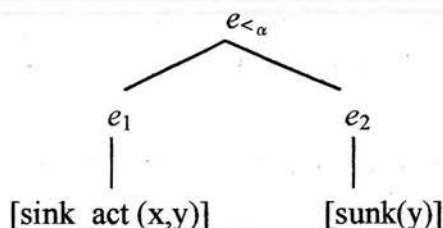
Pustejovsky assumes that transitions have a binary event structure, and gives four possible patterns of head configuration whose head is marked with an asterisk as follows:

- (102) a. $[e_T e_1^* <_\alpha e_2]$ — *build*
b. $[e_T e_1 <_\alpha e_2^*]$ — *arrive*
c. $[e_T e_1^* <_\alpha e_2^*]$ — *give*
d. $[e_T e_1 <_\alpha e_2]$ — *break* (Pustejovsky and Busa 1995:164)

As shown in (102), the causative/inchoative alternation class of verbs such as *break* are characterised as “headless” – headless is lexically unspecified, which makes available

two distinct grammatical constructions. Pustejovsky takes *affondare* (sink) in Italian as an example, whose unheaded event structure is illustrated as follows:

(103)



When the result state of the sunk entity is focused on, the predicates are right-headed and realised as unaccusatives, whereas when the agentive cause is foregrounded, the predicates are left-headed and grammaticalised as causatives.

However, regarding unaccusative verbs whose headedness is lexically specified, such a shift between left-headed and right-headed is never seen; they are always realised as unaccusative no matter what kind of construction they are embedded in.

2.2.3.2.3.2 van Hout's (1996) CHES model

The crucial concept behind van Hout's mapping theory is "Event identification", suggested in Grimshaw (1990), and Grimshaw and Vikner (1993), which states that a verb's event structure is syntactically identified. In other words, the event structure properties in the clause determine its syntactic configuration. The definition of Event identification is given by van Hout (1996: 197) as follows:

(104) Event identification:

Mapping requires that a verb's event structure, including every sub-event, be syntactically identified. A phrase in a syntactic argument position identifies (a part of) the event, because it is associated with an event participant.

As mentioned earlier, it should be noted that mapping requires that not the event features of the lexical verb, but those of the whole VP predicate should be identified. This is because the event type of the clause is not necessarily identical to the one that the verb lexically denotes; event type shifts depending on what kind of elements in the VP predicate (ie. prepositions, postpositions, particles, resultative predicates) combine with the verb. To exemplify this, van Hout gives three types of sentences in Dutch

with a motion verb, *zwemmen* (swim).

- (105) a. Claartje heeft de hele zomer in zee gezwommen.
C. has the whole summer in sea swim
“C. swam in the sea during the whole summer”
- b. Claartje is in 2 minuten naar de overkant gezwommen.
C. is in 2 minutes to the across-side swam
“C. swam across in 2 minutes”
- c. Claartje heeft haar badpak al in een zomer aan flarden gezwommen.
C. has her swimsuit already within one summer to tatters swam
“C. already swam her swimsuit to tatters within one summer.”

Basically, *zwemmen* (swim) lexically denotes the event-type of “process”, but these examples show that the event-type shifts depending on the predicate which the verb is embedded in, and the difference in the event type leads to a different mapping onto the syntax.

In (105a), the whole predicate has the event feature “atelic”, thus its single participant is mapped onto subject position in an unergative frame. In (105b), the verb combines with a “goal” phrase to yield a telic event, thus its single participant is mapped onto object position in an unaccusative construction. Finally, in (105c), the verb combines with a resultative predicate with a stative PP to denote a telic event, and its single participant is mapped onto subject position in a transitive frame.

Generalising these facts, van Hout formulate CHESS⁵ model as follows:

(106) The CHESS mapping conditions: checking event-semantic structure:

1. Mapping requires that the event structure of a predicate be identified.
2. There are two structural argument positions: the specifier position of Agr,S and Agr,O. An argument in either of these specifier positions identifies in that (sub)event.
3. Telic event type features must be checked in AgrOP

(van Hout 1996: 206)

⁵ CHESS stands for *C*hecking *E*vent-*S*emantic *S*tructure (see van Hout 1996: 204)

van Hout postulates two argument positions, which are the specifier positions of AgrS and AgrO. She considers that every verb must project at least AgrSP because the Extended Projection Principle (Chomsky 1981) requires every sentence to have a subject. Therefore, transitive, unergative, and unaccusative mappings differ in whether AgrOP is projected, or whether the specifier position of AgrOP is filled. Much the same as other scholars (McClure 1995; Borer 1994; Den Dikken 1994), van Hout assumes that AgrOP is the locus of telic feature-checking. Thus, the CHES model states that, if the predicate denotes a telic event, AgrOP must be projected.

2.2.3.2.4 Summary of the Predicate-based approach

As we have seen, McClure (1995), Borer (1994), and van Hout (1994, 1996) have in common the basic idea of the Predicate-based approach. The main characteristics of this are the assumption of a direct projection from aspectual/event structure properties onto syntactic argument positions, and also a view of mapping as movement from the inside of VP to either or both of two distinct specifier positions of functional projections. Furthermore, another similarity is that all of them assume an equivalent position as the locus for identifying a telic event (AP_{inner} for McClure 1995; AspEM for Borer 1994; AgrO for van Hout 1994, 1996).

Thus, the ideas behind these three theories are basically the same. However, they differ slightly in matter of detail. For example, in the aspectual/event theory which they are based on, they show differences. McClure (1995) presents his own aspectual representations, combining Larson's (1990) situation semantics with a modified version of the Vendler/Dowty classification. Van Hout (1994, 1996) employs a mapping theory thoroughly reliant on Pustejovsky's event structure. Borer (1994) does not refer to any specific aspectual theory, but her projection model gets its insights from Tenny's (1994) idea of "delimiter".

Among these theories, Borer (1994) and van Hout (1994, 1996) in particular have much more in common with each other, which is admitted by van Hout herself when she writes that "Borer (1994) arrives at the same conclusion in her approach to mapping, which is in various respects similar to the one advocated here" (van Hout 1996: 207). However, there seem to be two clear differences between them. One is concerned with how to capture the relation between aspectual interpretation and syntactic configuration. Borer claims that movement to the specifier positions of different aspectual positions

triggers different aspectual interpretations, which means that aspectual interpretation can be determined by syntactic configuration alone. Contrary to Borer, van Hout claims that movement to functional projections is motivated in the presence of the feature *telicity* that has to be checked. In this respect, her approach is more restrictive than Borer's.

Another difference concerns the regulation of NP movement for unaccusatives. Van Hout requires the single argument of unaccusatives to move to Spec of AgrS via Spec of AgrO, while Borer states that the sole argument must move to either one of these two functional projections, but not both.

2.2.4 Summary and discussion of the three different approaches

In this chapter, three different types of approach to unaccusativity have been examined: the purely syntactic approach, the purely semantic approach, and the interface approach. To summarise each claim, the purely syntactic approach treats unaccusativity as a unified phenomenon, which represents a particular common configuration. It never admits the usefulness of semantic generalisations to account for the distinction between unergatives and unaccusatives.

In contrast, the purely semantic approach denies that unaccusativity is syntactically encoded, and claims that the distinction between the two classes of intransitive verbs is better explained in semantic terms.

Finally, the interface approach assumes that "unaccusativity is syntactically represented but semantically determined" (Levin and Rappaport Hovav 1989:316). It does not deny either of the roles of semantic characterisation or syntactic configuration in the account of unaccusativity.

Having observed the claim of each approach, it is now time to consider which approach should be employed for this study. This study takes the position which the interface approach presents, that is, unaccusativity is better explained in the association of both syntactic and semantic factors. One of the reasons for taking this position is that I support the definition of unaccusativity presented by Levin and Rappaport Hovav (1995) – the distinction between unaccusative and unergative verbs is determined by semantic properties, and represented by syntactic representations. To justify our

position, it would be appropriate to raise some problems which the other two approaches, the purely syntactic approach, and the purely semantic approach, seem to have.

Firstly, the main problem with the purely syntactic approach is that it cannot really account for the variation of unaccusativity, so-called “unaccusative mismatches” within a language and cross-linguistically, because it strictly defines unaccusativity as a unified phenomenon, therefore once it faces inconsistency or variation of syntactic behaviour, it loses explanatory power, and cannot provide a plausible account. Also, the account of unaccusativity using only syntactic configuration is not sufficient, because in fact, many of the constructions are constrained by semantic factors.

Secondly, the problem with the purely semantic approach is that it is not possible to define the distinction between unaccusativity and unergativity exclusively by means of semantic factors. As Levin and Rappaport Hovav (1995:14) point out that “the semantic properties of the verb may be a necessary, but not a sufficient, condition for passing an unaccusative diagnostic”, it is the case that even though a verb possesses a semantic property which is relevant to unaccusatives, it may not pass an unaccusative diagnostic. For example, *telicity* is considered as one of the semantic components which is relevant to auxiliary selection of *zijn* (be) in Dutch, however, this is not a sufficient condition to select *zijn* (be), and a syntactic condition (that the verb phrase is intransitive) should be fulfilled (see Levin and Rappaport Hovav 1995:15).

Taking all the problems mentioned above into consideration, it seems to be crucial for the account of unaccusativity to integrate the domain of both syntax and semantics, as claimed in the interface approach. There are quite a few studies which take up this position (see section 2.2.3 of this chapter), but they differ considerably in their details. Among these studies categorised in the interface approach, our study will employ Sorace’s (2000) theories on unaccusativity as its basis in Chapter 4.

CHAPTER 3

UNACCUSATIVITY IN JAPANESE

3.0 Introduction

It has not been long since the study of unaccusatives in Japanese was initiated by Japanese linguists (Miyagawa 1989; Takezawa 1991; Tsujimura 1990a, 1990b, 1990c, 1991, 1994, 1996; Terada 1987,1990; Kishimoto 1996; Kageyama 1993,1996). These researchers have attempted to demonstrate that the "Unaccusative Hypothesis" presented for Dutch and Italian (Perlmutter 1978; Burzio 1986) is also applicable to Japanese. They have also sought diagnostic tests which are suitable to identify unaccusatives in Japanese. Among the various diagnostics presented so far, we shall review in Section 3.1 seven different phenomena as evidence for unaccusativity in Japanese – floating quantifiers (Miyagawa 1989), resultative constructions (Tsujimura 1990a, 1990b, 1994, 1996), *te-iru* constructions (Takezawa 1991), and case-marker drop⁶ (Kageyama 1993), the *takusan* construction, the *kake* deverbal nominalisation, and Sino-Japanese complex predicates.

In Section 3.3, the aspectual system in Japanese is outlined. Here, the aspectual classification of verbs in Japanese by Kindaichi is introduced, followed by Vendler's (1967) classification of English verbs, for comparison. Finally, the modification of Kindaichi's (1976) classification by McClure (1995) will be presented. We lead into the review of diagnostic phenomena for unaccusativity by examining the evidence on floating quantifiers.

3.1 Preceding studies on unaccusativity in Japanese

3.1.1 Evidence based on floating quantifiers

Compare the following examples.

⁶The phenomenon, case-marker drop is presented as evidence for surface unaccusativity in Japanese, but it is still controversial whether it is valid as a diagnostic test, because this is a phenomenon mainly found in spoken language, and accordingly it is hard to get data from written tests e.g. judgement tests. However, case-marker drop is still a phenomenon which has been widely studied within GB, in relation to topics such as scrambling (Saito 1985), abstract case (Kuroda 1988) and so on. Therefore, it has been included in the review.

- (107) a. Kodomo-ga hutari [_{VP} inu-to yukkuri aruita]
 child –NOM two dog-with slowly walked
 “Two children walked slowly with a dog”

- b.* Kodomo-ga [_{VP} inu-to yukkuri hutari aruita]
 child –NOM dog-with slowly two walked
 “Two children walked slowly with a dog”

- (108) a. Kodomo-ga hutari [_{VP} inu-to (gakko-ni) tuita]
 child –NOM two dog-with school-at arrived
 “Two children arrived at school with a dog”

- b. Kodomo-ga [_{VP} inu-to hutari (gakko-ni) tuita]
 child –NOM dog-with two school-at arrived
 “Two children arrived at school with a dog”

Miyagawa (1989) claims that an NP and its numeral quantifier cannot be too distant from each other in Japanese phrase structure, because NP and the numeral quantifier must mutually c-command each other. In (107a), the numeral quantifier, “hutari”, modifies the subject NP. This is grammatical, because both are outside VP, and c-command each other. In (107b), the numeral quantifier is supposed to quantify the subject NP, but this is ungrammatical—the quantified NP is outside the VP, but the numeral quantifier is inside VP.

(108a) is grammatical just like (107a). However, (108b) is grammatical in contrast to (107b). Miyagawa explains that this stems from the different syntactic structures in (107) and (108) – the surface subject in (107) originates outside VP, but the surface subject in (108) originates in the direct object position. That is, in (108), the NP which occurs in the direct object position moves into the subject position leaving a trace behind, therefore the mutual c-command relationship with the numeral quantifier is preserved in (108b), as shown below.

- (109) a. [_{IP} [_{VP} NP NQ V]
 b. [_{IP} NP_i [_{VP} t_i NQ V]

In contrast, between (107a) and (107b), the mutual c-command relationship with the

numeral quantifier is not maintained, as shown in (110a) and (110b).

- (110) a. [IP NP NQ [VP V]]
 b.* [IP NP [VP NQ V]]

Miyagawa's account of NP-movement from inside VP to outside VP is similar to Burzio's explanation. Thus, the different syntactic behaviour of numeral quantifiers is one of the pieces of evidence to prove the existence of syntactic unaccusativity in Japanese. In addition, the behaviour of the passive construction with numeral quantifiers confirms Miyagawa's claim. Look at the following sentences.

- (111) a. Dorobo ga [vp hon- o san-satsu nusunda]
 thief- NOM book ACC three-bound-volumes stole
 "A thief stole three books"
 b. Hon ga [vp doroboo- ni ti san-satsu nusum-are-ta]
 book- NOM thief by three-bound-volumes steal-PASS-PAST
 "Three books were stolen by a thief"

In both (111a) and (111b), the relation between the NP(or its trace) and the numeral quantifier is one of mutual c-command within VP. Therefore, both are grammatical.

So far, we have observed a distinctive difference with floating quantifiers between unaccusatives and unergatives, but Tsujimura (1991,1994,1996) points out that there are unergative verbs that show unaccusative properties when taking additional PPs that denote a "goal" of motion. Look at the following examples.

- (112) a.* Kodomo-ga [vp inu-to yukkuri hutari aruita]
 child-NOM dog-with slowly two walked
 "Two children walked slowly with a dog"
 b. Kodomo-ga [vp inu-to yukkuri gakko-made hutari aruita]
 child-NOM dog-with slowly school-as far as two walked
 "Two children walked slowly to the school"

(112b) is the same example as (107b). Just adding a PP headed by the postposition *made* – *gakko-made* (as far as the school), the judgement greatly improves. Tsujimura explains this phenomenon as a shift in the verb's properties from unergative to

unaccusative. More precisely, unergative manner of motion verbs plus goal phrases such as “*made*” exhibit unergative/unaccusative shift as seen in Italian and Dutch (see section 2.2.3.1.1.6). Tsujimura gives some examples from Italian and Dutch adapted from Rosen (1984) and Zaenen (1993), respectively.

(113) **Italian**

- a. Ugo ha corso meglio ieri (AVERE selection)
“Ugo ran better yesterday”
- b. Ugo è corso a casa (ESSERE selection)
“Ugo ran home”

(Rosen 1984: 86)

(114) **Dutch**

- a. Hij heeft/*is gelopen
“He has/is run.”
- b. Hij is/? heeft naar huis gelopen
“He is/has run home”

(Zaenen 1993:22)

These examples show that the shift from unergative to unaccusative by adding goal phrases is observed across a range of languages. However, there still remains a question—why and how can the additional goal phrase *made* bring about the classification shift from unergative to unaccusative? Furthermore, Tsujimura raises another question—why is this change caused only by a particular postposition “*made*”, but not by *ni* or *e*, which are similar types of postposition? Tsujimura posits these two points as the main topics for her discussion, and attempts to give an account for them. Her account is closely related to that for the resultative construction. So, first, we shall look at the next piece of evidence for unaccusativity in Japanese, and then go back to Tsujimura’s discussion later.

3.1.2 Evidence based on the resultative construction.

Recall the discussion on the resultative construction in 2.2.3.1.1. Simpson (1983) notes that a resultative phrase may only modify an internal argument of the verb. Look at the following examples:

- (115) a. He broke the vase into pieces.
b. The vase broke into pieces.

- (116) a. John painted the car red.
b. The car was painted red.

However, the resultative phrase cannot modify the subject of simple intransitive verbs which have no internal argument as shown in (117).

- (117) a. * He broke the vase tired.
b. * John painted the car tired.

In (117a) and (117b), the resultative phrase “tired” cannot modify the external argument of the verb “he”, “John”, in other words, it cannot be interpreted as being predicated of the subject.

Tsujimura (1990a, 1990b) notes that a similar generalisation can be made for Japanese as shown in (118), (119) and (120).

- (118) a. Kare ga kabin-o konagona ni watta.
he- NOM vase-ACC pieces into broke
“He broke the vase into pieces”
b. Kabin ga konagona ni wareta.
vase- NOM pieces into broke
“The vase broke into pieces”

- (119) a. John ga kuruma-o akaku nutta.
John- NOM car- ACC red painted
“John painted the car red”
b. Kuruma ga akaku nu- rare- ta.
car- NOM red paint-PASS-PAST
“The car was painted red”

- (120) a. * Kare- ga kutakutani kabin-o watta.
he- NOM (dead) tired vase-ACC broke
“* He broke the vase tired”

- b.* John- ga kutakutani kuruma- o nutta.
 John- NOM (dead) tired car- ACC painted
 “*John painted the car tired”

In (118a), the resultative phrase modifies the internal argument. Therefore, the sentence is grammatical. In (118b), the resultative phrase appears to modify the external argument, but the NP in subject position is actually the internal argument which has been moved. In (119a), the resultative phrase modifies the internal argument. In (119b), since the V is passive, the subject position is occupied by the internal argument and hence the sentence is grammatical. In (120a), the resultative phrase is intended to modify the subject, but this is an external argument, hence it is ungrammatical. Finally, in (120b), the situation is the same. Furthermore, like in English, the resultative phrase cannot modify the subject of simple intransitive verbs which have no internal argument as follows:

- (121) a.* John-ga kutakuta-ni hasitta
 John-NOM tired ran
 “John ran tired”
 b.* John -ga kutakuta-ni waratta
 John-NOM tired laugh
 “John laughed tired”
 c.* John -ga kutakuta-ni odotta
 John-NOM tired danced
 “John danced tired”

To summarise according to McClure(1995:10) again,

(122) Resultatives (Japanese)

a. Direct object

Kuruma- o akaku nutta (=akai kuruma)
 car- ACC red painted (=red car)
 “(I) painted the car red”

b. Passive subject

Inu- ga kiree- ni arawareta (=kiree-na-inu)
 dog- NOM pretty- DAT was washed (=pretty-GEN-dog)
 “ The dog was washed clean”

Here, we return to Tsujimura's discussion, again. Recall that here are two main questions that she is concerned with:

- (123) a. Why and how does the additional goal phrase "*made*" bring about the classification change from unergative to unaccusative?
b. Why is this change caused only by one particular postposition "*made*" but not by *ni* or *e*, which are similar types of postposition?

Tsujimura provides an answer for these questions, which can be well summarised with this quotation from her paper.

...*made* phrases that cooccur with manner of motion verbs should be considered as resultative predicates that describe change of location as a result of the motion denoted by the verb; while the postpositions *ni* and *e* do not bear the predicative function, and hence maintain their roles as modifiers. (Tsujimura 1994: 345)

To start examining her answer to the first question, the crucial point that she makes is that the goal phrase, *made* + NP, should be regarded as a resultative predicate, which means the resultative phrase requires an NP to modify in the internal argument position. This requirement is called Direct Object Restriction by Levin and Rappaport Hovav (1995: 33). However, unergative verbs have only single external argument, so accordingly this sole argument must necessarily leave a trace behind inside VP at D-structure, which is to be modified by the resultative predicate. Tsujimura explains that this is why the addition of a goal phrase exhibits unaccusative properties, and allows floating quantifiers.

With respect to the second question, Tsujimura suggests that the different syntactic behaviour between "*made*", and "*ni*" and "*e*" stem from semantic differences, which are subtle but significant. Her claim is that "*made*" marks the endpoint of the motion more clearly than *ni* and *e* (Tsujimura 1994: 345). More concretely, she explains that the postpositions *ni* and *e* do not define "goal" in an explicit way, while *made* explicitly denotes the endpoint. Tsujimura (1994: 345) concludes that "(the postpositions *ni* and *e*) do not seem to set the endpoint explicitly to qualify to be a resultative secondary predicate". Borrowing Tenny's term, "delimiter", *made* has the function of *delimiter* –making the endpoint, while *ni* and *e* do not.

3.1.3 Evidence based on the *-te iru* construction.

In Japanese, verbs in the *-te* form may be combined with the auxiliary verb *iru*. This construction can express two main meanings: progressive and resultative. Look at the following examples.

(124) Progressive

- a. Taro ga hasitte-iru
Taro- NOM running-be
“Taro is running”
- b. Taro ga odotte-iru
Taro- NOM dancing-be
“Taro is dancing”

(125) Resultative

- a. Chocolate ga tokete-iru
Chocolate- NOM melted-be
“The chocolate has melted”
- b. Mado ga kowarete-iru
window- NOM broken-be
“The window has broken”

As shown by the English translations, the *-te + iru* construction is equivalent to the English construction *be + -ing* in the case of the progressive interpretation, and equivalent to English *be + past participle* in the Resultative interpretation. This means that using the *-te* form of a verb with *iru* can represent two different aspectual states: “telicity” and “atelicity” (Dowty 1979). The question is, which factors decide which interpretation a given verb used in this way may have? At first glance, it seems that the difference is one of unaccusativity versus unergativity. For example, unergative verbs like “*hashiru* (run)”, “*odoru* (dance)” are assumed to have a progressive interpretation, and unaccusative verbs like “*tokeru* (melt)”, “*kowareru* (break)” have a resultative interpretation. Compare the following examples to (126).

- (126) a. Mary ga chocolate o tokasite-iru.
Mary- NOM chocolate- ACC melting-be
“Mary is melting the chocolate”

- b. Dorobo ga mado o kowasite-iru.
 thief- NOM window- ACC breaking-be
 “A thief is breaking the window”

These examples use the transitive variants of the unaccusative verbs from (125a) and (125b). However, with these verbs only the progressive interpretation is licensed. Takezawa (1991) suggests that the theta-role of the S-structure subject determines which interpretation is allowed. He argues that only when the S-structure subject carries a Theme theta-role, does it allow a resultative interpretation. His explanation applies to all the examples in (124), (125), and (126) - in (124) and (126), the theta-role of each subject is *Agent*, therefore only a progressive interpretation is allowed; in the examples in (125), the subject theta-role is *Theme*, and hence they can be interpreted as resultative. Unaccusative verbs are verbs which move a D-structure Theme in the Object position to become an S-structure Subject. So unaccusatives allow resultative interpretations. Let us look at other examples to support his argument.

- (127) a. Tom ga nimotu o hakonde-iru (progressive)
 Tom- NOM luggage- ACC carrying-be
 “Tom is carrying the luggage”
 b. Nimotu ga (Tom ni yotte) hakobare-te-iru (resultative)
 luggage- NOM (Tom- by) carry- PASS-be
 “The luggage has been carried (by Tom)”
- (128) a. Tom ga heya o (heater de) atatamete-iru (progressive)
 Tom- NOM room- ACC (heater- by) heating- be
 “Tom is heating the room with a heater”
 b. Heya ga (heater de) atatamerare-te-iru (resultative)
 room- NOM (heater- by) heat-PASS-be
 “The room has been heated by heater”

In (127) and (128), *hakobu* (carry) and *atatameru* (warm) are transitive verbs, with an Agent theta-role assigned to the Subject position, so the interpretation must be progressive. In (127) and (128), *hakobareru* and *atatamerareru* are passive forms, with a Theme theta-role base-generated in Object position and moved to Subject position, thus allowing a resultative interpretation. These examples (127) and (128) also support Takezawa's (1991) theory - when the Theme appears as S-structure Subject as

a result of passivization, the resultative interpretation is allowed.

To summarise the generalization about the interpretation of the *-te + iru* construction based on Takezawa (1991), we can state the following: the resultative interpretation of the *-te + iru* construction can be licensed only when the Theme which originates in the Object position is moved to the Subject position, leaving behind a trace in the VP. This generalisation can be illustrated as follows:

- (129) a. Resultative
 [_{IP} NP_i [_{VP} t_i V-te-iru]]
 b. Progressive
 [_{IP} NP [_{VP} V-te-iru]]

Furthermore, Takezawa (1991) presents an interesting view of the *-te + iru* construction. He suggests this construction may have something common with perfect tense auxiliaries in Italian.

- (130) a. Maria **ha** telefonato (unergative)
 has telephoned
 “Maria has telephoned”
 b. Maria **è** stata accusata (passive)
 is been accused
 “Maria has been accused”
 c. Maria **è** arrivata (unaccusative)
 is arrived
 “Maria has arrived”

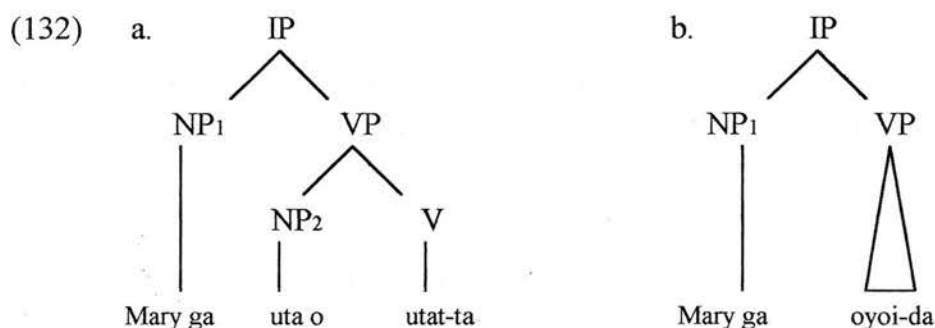
(Takezawa 1991:64-65)

In (130a), *telefonare* is an unergative verb, and hence takes the AVERE auxiliary in the Perfect. In (130b), *stata accusata* is a passive form, and hence takes the ESSERE auxiliary. In (130c), *arrivare* is an unaccusative verb, and hence takes the ESSERE auxiliary. In Italian, passives and unaccusatives share the property of taking the ESSERE auxiliary, and hence contrast with unergatives and transitives. In Japanese, passives and unaccusatives share the property of allowing a resultative interpretation, and hence contrast with unergatives and transitives. This shows an obvious parallel to Italian.

3.1.4 Evidence based on the phenomenon of “case-drop”

In Japanese, every NP is marked with a case particle. There are five main case particles, which are the nominative *ga*, the accusative *o*, the dative *ni*, the genitive *no*, and the topic *wa*. Basically, the nominative *ga* is assigned to the subject, while the accusative *o* is to the direct object. Look at the following examples and the simplified diagrams.

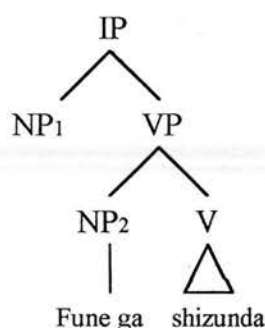
- (131) a. Mary *ga* uta *o* utat- ta
 Mary NOM song ACC sing PAST
 “Mary sang a song”
 b. Mary *ga* oyoï- da
 Mary NOM swim- PAST
 “Mary swam”



As shown in the diagrams, NP1 is usually marked with the nominative case *ga*, but NP2 is marked with the accusative case *o*. However, there are examples where NP2 is accompanied by the nominative case *ga* as follows.

- (133) Fune *ga* sizun- da
 boat NOM sink-PAST
 “The boat sank”

(134)



Burzio's Generalization (1986) clearly explains this phenomenon of case assignment.

(135) **Burzio's Generalization:**

A verb Case-marks its object if and only if it θ -marks its subject.

In the Japanese structure, the NP accompanied by the nominative *ga* is always realised, whereas the NP marked with the accusative *o* never exists unless there is NP accompanied by the nominative *ga*. That is, accusative case assignment never precedes nominative case assignment. In (133), it is assumed that the internal argument *fune* moves to the subject position to be assigned the nominative case *ga*, because the external argument does not exist in the D-structure.

In the S-structure, (131b) and (133) are identified as the same intransitive construction, but these sentences display different syntactic behaviour. The phenomenon of "case-drop" is an instance, which is a phenomenon where case particles are omitted in informal speech. This is quite often seen in Japanese phrase structure. The case particle cannot always be dropped. Under some circumstances, case-drop makes a sentence totally ungrammatical. There seem to be some constraints on it. One of the criteria for case-drop is "retrievability" ie. whether it is easy to predict the original case.

From a different point of view, Kageyama (1993) presents some interesting data to show that there is a difference of behaviour in case drop between unaccusative and unergative construction. Compare the following examples.

(136) **Unaccusatives**

- a. [Kootuu - ziko - (ga) okoru] no mi-ta koto aru?
traffic accident- (NOM) happen NOML see-PAST thing be
"Have you ever seen traffic accidents happen?"

- b. Ano kodomo [nando de oyu - (ga) waku-ka] sira-nai
 that child what degree at hot water-(NOM) boil-whether know-NEG
 “That child doesn’t know what degree water boils at.”

(137) **Unergatives**

- a. [Kanzya - *(ga) abare - ta] no shitte- imasu-ka?
 Patience -NOM become violent-PAST NOML know- be - Q
 “Do you know that the patient became violent?”
- b. [Tanaka-kun-*(ga) sigoto-suru] no mi-ta koto nai
 Tanaka-title-NOM work -do NOML see-PAST thing not be
 “Have you ever seen Mr.Tanaka working?”

(Kageyama, 1993:56)

Obviously, the nominative case *ga* is obligatory in unergative constructions, whereas in unaccusative structures, the case can be dropped without any problem. The case-drop can be also seen in the accusative case *o* in transitive construction.

(138) **Transitive**

- a. [Kodomo-tati *(ga) hon (o) yomu] no mi-ta koto nai
 Child -PL NOM book-(ACC) read NOML see-PAST thing not be
 “I have never seen the children reading books”
- b. Kono tikaku ni [tabako (o) utteru mise] ari-masen- ka
 this near by cigarette-(ACC) sell shop be-NEG-Q
 “Is there any shop near by which sells cigarettes?”

(Kageyama,1993:56)

The accusative *o* in (138a) and (138b) can drop like in (136), while the nominative *ga* in (138a) cannot drop like in (137). These sentences exemplify the fact that the subject in the unaccusative structure shows a parallel behaviour in case-drop with the object in the transitive structure.

What is notable is that many errors by learners of Japanese regarding case assignment have been reported. Most of the typical errors stem from taking the nominative *ga* for the accusative *o*. For example, there are many errors resulting from wrongly assigning the accusative *o* to the subject of unaccusatives instead of the nominative *ga*. The following examples are from Teramura (1990).

- (139) a. Jikan o [ga] tat-ta
 time ACC[NOM] pass-PAST
 “Time has passed”
- b. zyoukyou o [ga] okot-ta
 situation ACC[NOM] occur-PAST
 “The situation has occurred”
- c. Mondai o [ga] deteki- ta
 problem ACC[NOM] emerge-PAST
 “The problem has emerged”

3.1.5 Evidence based on the *takusan* construction

The adverb *takusan* basically does not choose which NP to modify. It modifies any NP regardless of whether it is a subject or an object as shown in (140).

- (140) a. takusan-no hito - ga sono uta-o utat-ta
 a lot-GEN people-NOM the song-ACC sing-PAST
 “A lot of people sang the song.”
- b. Naomi-ga takusan-no uta-o utat-ta
 Naomi-NOM a lot – GEN song-ACC sing-PAST
 “Naomi sang a lot of songs.”

Kageyama (1993,1996) observes that when the subject and the object are dropped, the adverb *takusan* modifies not the null subject but the null object. Look at the following examples:

- (141) a. Takusan utat-ta
 a lot sing-PAST
 “he/she/we/they sang a lot (of songs)”
- b. Takusan tui-ta
 a lot arrive-PAST
 “A lot of people arrived”
- c. Takusan ason-da
 “he/she/we/they played a lot”

There is a difference of meaning manifested between a,b, and c. In (141a) and (141b), *takusan* modifies the null object of the transitive verb (song), and the null object of the unaccusative (people), respectively. In contrast, the unergative sentence (141c) does not have a null object to be modified by *takusan*, therefore *takusan* just expresses the amount of action which is inherently denoted. Thus, even if the subject and the object are omitted, this is never exhibited in the reading.

3.1.6 Evidence based on the *kake* deverbal nominalization

Kishimoto (1996) proposes another diagnostic for the unergative/unaccusative distinction: the *kake* deverbal nominalization, which is a common pronominal modification in Japanese. The suffix “be about to, do halfway” *kake* is attached to a verbal stem modifying a noun, with the genitive marker *no* between them. The deverbal nominal with *kake* restricts the NP which it modifies to the object of a transitive verb or the subject of an unaccusative as shown in (142a) and (142b), but not the subject of a transitive verb or an unergative verb as in (142a) and (142b).

- (142) a. kaki -kake -no tegami
 write-KAKE-GEN letter
 “a half-written letter”
 b. kusari- kake- no tamago
 rot-KAKE-GEN egg
 “a half-rotten egg”
 c. *kaki- kake- no syonen
 write-KAKE-GEN boy
 “*a half-written boy”
 d. *mati - kake- no kanzya
 wait-KAKE-GEN patient
 “*a half-waited patient”

Kishimoto suggests that apart from the constraints of the noun which is modifies, there are other construction-specific restrictions, which can be summarised in three main constructions. The first and second restrict the semantic properties of verbs which the suffix *kake* is attached to. Since *kake* is derived from a verb whose aspectual function is to express “start” or “begin”, verbs to be suffixed with *kake* have to denote the initial

(145) **inception reading**

- a. sini- kake- no byoonin
die-KAKE-GEN patient
“a patient, almost dying”
- b. hazimari- kake- no geki
begin-KAKE-GEN play
“a play, almost beginning”

(extracted from Tsujimura and Iida 1999:110)

Tsujimura and Iida point out that the inception reading is available with any verb, while the “halfway” reading is possible only with verbs which denote (non-punctual) telicity. Their analysis is summarized in Table 3-1.

Table 3-1: The summary of Tsujimura and Iida’s analysis

	Telic		Atelic	
	Achievement	Accomplishment	Activity	Stative
Halfway reading	NO	OK	OK NO	NO
Inception reading	OK	OK	OK	OK

(Tsujimura and Iida 1999:127)

Table 3-1 shows that the “halfway” reading is possible only with the subset of activity verbs. Tsujimura and Iida explain that this is because there are cases where contextual information delimits eventuality of activity verbs, and make them enable to received the “halfway” reading.

3.1.7 Evidence based on the Sino-Japanese complex predicates

Parallel to Japanese native verbs, Sino-Japanese complex predicates can be classified into subcategories such as intransitive and transitive despite having no morphological manifestations. Examples are presented in (146) and (147).

(146) transitive (without an intransitive counterpart)

- a. Syonin-ga nedan-o HIKAKU-sita
dealer-NOM price-ACC compare-did
“A dealer compared the price.”

- b. Otoko-ga nimotu-o UNSO-sita
 man- NOM luggage-ACC carry-did
 "A man carried the luggage."
- c. Gakusei-ga iseki-o TYOUSA - sita
 student-NOM ruins-ACC investigate-did
 "A student investigated the ruins."
- d. Kyoushi- tachi- ga kaigishitsu -o SIYO-sita
 teachers- -NOM conference room-ACC use - did
 "Teachers used the conference room."

(147) intransitive (without a transitive counterpart)

- a. Kodomo-ga niwa-de UNDO-sita
 child-NOM garden-at exercise-did
 "A child exercised in the garden."
- b. Syonen-ga butai-de ENGI - sita
 boy- NOM stage-at performed-did
 "A boy performed on the stage."
- c. Hikouki- ga umi-ni TUIRAKU- sita
 airplane-NOM sea-in fall - did
 "An airplane fell in the sea."
- d. Densya – ga eki-ni TOTYAKU - sita
 train – NOM station-at arrive – did
 "A train arrived at the station."

Miyagawa (1989) and Tsujimura (1990a, 1990b), among others, claim that the intransitive verbs in (147) are further divided into unergatives and unaccusatives, just like Japanese native verbs. Tsujimura (1990a, 1990b) attests that unaccusativity is observed in Sino-Japanese complex predicates by applying several different diagnostics such as Resultatives, accusative-case assignment, and quantifier floating. As the accusative-case assignment test is widely known as a diagnostic test for Sino-complex predicate, it is closely examined here:

- (148) a. Kodomo-ga niwa-de UNDO-o sita
 child-NOM garden-at exercise-ACC did
 "A child exercised in the garden."

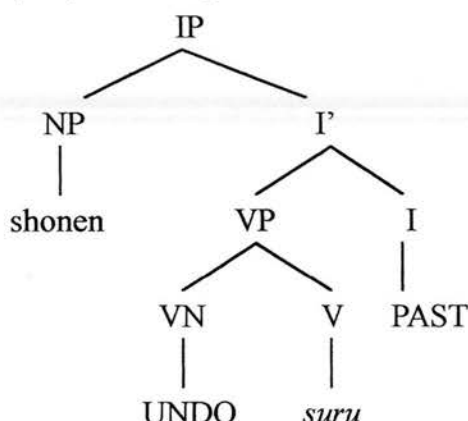
- b. Syonen-ga butai-de ENGI -o sita
 boy- NOM stage-at perform-ACC did
 "A boy performed on the stage."
- c. *Hikouki- ga umi-ni TUIRAKU-o sita
 airplane-NOM sea-in fall-ACC did
 "An airplane fell in the sea."
- d. *Densya – ga eki-ni TOTYAKU-o sita
 train – NOM station-at arrive-ACC did
 "A train arrived at the station."

The example shows a clear contrast between (148a), (148b) and (148c), (148d). This is a test to see whether the verb *suru* has the ability to assign accusative case to the Sino-Japanese compound nouns. All the Sino-Japanese complex predicates in (147a), (147b), (147c), and (147d) share the same ending *suru*, but the meaning of the entire predicate is completely determined by that of Sino-Japanese verbal noun. Likewise, the ability to assign accusative case by the verb *suru* is a property solely of the Sino-verbal noun. Tsujimura (1990a, 1990b) differentiates between Sino-Japanese nouns in (148a), (148b) and (148c), (148d), by calling the former unergative nouns, and the latter unaccusative nouns. The difference between these two types of noun is that an unergative noun has the ability to assign a theta role to the subject argument, which makes *suru* able to assign accusative case to the noun, while an unaccusative noun does not have the ability to assign a theta role to the subject argument, because it lacks an external argument, which is required to assign accusative case. This supports Burzio's (1986) generalization.

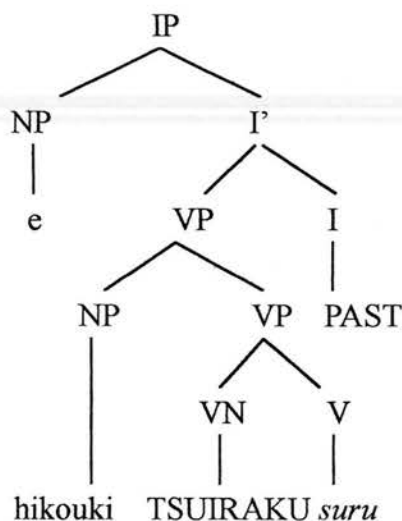
(149) A verb case-marks its object if and only if it theta marks its subject.

The difference in the syntactic structure between the two types of predicates is illustrated as follows:

(150) a. Unergative



b. Unaccusative



(150a) and (150b) show a clear contrast, that is, (150a) takes an external argument outside the VP, *syonen* 'boy', while (150b) does not have an external argument but an internal argument *hikouki* 'airplane' in the VP.

3.2 Summary of unaccusativity in Japanese

We have outlined seven different phenomena as evidence for unaccusativity in Japanese. In order to scrutinise the nature of Japanese verbs, the aspectual system will be reviewed in the next section.

3.3 The aspectual system in Japanese

To borrow Comrie's (1976:3) definition of the term "aspect", we can describe it as, "different ways of viewing the internal temporal constituency of a situation." For the same verb, aspect will differ depending on each event and situation described by the verb. In addition, there can exist a variety of aspectual interpretations of the verb such that aspect is often manifested as a combination of the inherent aspectual character of the verb as well as certain aspectual affixes. According to Jacobsen (1992:157), there are three sources which contribute to aspectual meaning in Japanese:

- (151)
- a. the inherent meaning of verbs or predicates.
 - b. modification of that meaning provided by verbal affixes (auxiliaries)
 - c. further modification based on the semantic contribution of nouns, adverbs,

and other linguistic items present in the clause as a whole.

With regard to source (151b), some examples of aspectual affixes are given as follows:

- (152) *-dasu* ex. *hanasi-dasu* “start to talk” (*hanasu* “talk”)
 tabe-dasu “start to eat” (*taberu* “eat”)
 -ageru ex. *kaki-ageru* “write up” (*kaku* “write”)
 shi-ageru “finish up” (*suru* “do”)

The “*te-iru*” construction which will be discussed later can be categorised under (151b). This construction allows two possible interpretations: perfect and progressive.

Opinions differ concerning (151c), as to whether the predicate should be treated as contributing towards the aspectual properties, when we discuss the aspectual classification of the verb. Dowty (1979) argues that we need to capture the aspectual properties in the verb phrase as a whole rather than the aspectual properties of individual verbs. However, we shall examine Kindaichi’s (1976) verbal classification in Japanese in the next section, which focuses specifically on the aspectual properties of individual verbs. This section will be mainly concerned with (151a).

3.3.1 The aspectual classification of verbs in Japanese – Kindaichi (1976)

Kindaichi (1976) presents a similar classification of Japanese verbs to Vendler’s (1967) analysis. Kindaichi classified Japanese verbs into four distinct classes according to their aspectual properties, which were defined respectively as Stative, Continuative, Instantaneous, and Type Four (the English translation from Jacobsen, 1992). Kindaichi’s classification shares the same basis with Vendler’s, which is “time schemata”, implying the length of time, as the labels like “Instantaneous” and “Continuative” in his taxonomy obviously show. However, as for the diagnostic test used to distinguish verbs into classes unlike Vendler and Dowty (1979), Kindaichi’s classification is solely based on the behaviour and the interpretation of verbs with the “*te-iru*” construction (See 3.1.3 for details).

Traditionally, the *te-iru* construction has been used as a manifestation of the aspectual properties of verbs. The verbs in each of the four classes display different patterns of behaviour in the *te-iru* form. To put it briefly, Stative verbs never allow the *te-iru*

construction, but Type Four verbs must always appear in the *te-iru* construction. The difference seen between Continuative and Instantaneous verbs is related to their interpretations in the *te-iru* form. Continuative verbs take a “progressive” reading with the *te-iru* construction, while the Instantaneous verbs take a “perfect” reading with it. Examples from each class are given in Table 3.2. In Japanese, the number of Stative verbs is not large, therefore Instantaneous and Type 4 verbs used in the *te-iru* form function as Stative like verbs to compensate.

Table 3-2: The Aspectual Classification of Japanese Verbs by Kindaichi (1976)

Stative	Continuative	Instantaneous	Type 4
<i>aru</i> “be”	<i>yomu</i> “read”	<i>sinu</i> “die”	<i>sobieru</i> “tower”
<i>dekiru</i> “can do”	<i>kaku</i> “write”	<i>kieru</i> “be turned off”	<i>sugureru</i>
<i>hanaseru</i> “can speak”	<i>warau</i> “laugh”	<i>sawaru</i> “touch”	“be outstanding”
<i>mieru</i> “be visible”	<i>utau</i> “sing”	<i>kimaru</i> “be decided”	<i>arihureru</i>
			“be common”

(Selected from Kindaichi 1976)

3.3.2 Some criticisms of Kindaichi’s classification -Jacobsen (1992) et.al.-

Following Kindaichi (1976), several scholars have investigated the *te-iru* construction and its relation to aspect. Jacobsen (1992) is one of them, and he gives a detailed account of the aspectual classification of verbs, investigating the meaning of the affix, *te-iru* and the inherent aspectual character of the verb to which it is attached. Jacobsen reviews several studies on aspect following Kindaichi. Of these, one critique of Kindaichi’s classification, by Okuda (1978a, 1978b), seems to parallel Jacobsen’s own views. Jacobsen’s comments can be mainly summarised in the following two points. Firstly, he points out that Kindaichi captures the aspectual character of individual verbs rather than that of predicates, which leads to a failure to account for differences in the aspectual behaviour of one particular verb in different constructions. Compare the following examples:

- (153) a. Bill- wa ima hon- o yonde- iru
 Bill- TOP now book- ACC reading- be
 “Bill is reading a book now.”

- b. Bill- wa takusan hon- o yonde- iru
 Bill- TOP many book-ACC read- be
 “Bill has read many books.”

According to Kindaichi’s classification, the verb *yomu* “read” can be categorised as a Continuative verb, which takes a progressive meaning with *te-iru*. However, in (153b), it takes a perfect meaning, which means that the aspectual meaning of *te-iru* can differ from that of the verb phrase in which the verb is used. Jacobsen proposes that the inherent aspectual character of the whole predicate should be taken into consideration when the aspectual classification of the main verb is determined, even though they seem to be very elusive.

The second point resulting from Jacobsen’s discussion is concerned with the two categories in Kindaichi’s classification: “Continuative” and “Instantaneous.” Referring to a similar criticism by Okuda (1978a, 1978b), he points out that Kindaichi’s original distinction between Continuative and Instantaneous is not able to account for the distinction between the perfect and progressive interpretations associated with the *te-iru* construction. In other words, the concept of the time length of an event is not appropriate as a factor in the determination of the interpretation of the *te-iru* construction. Jacobsen suggests that an alternative fundamental factor is required to account for the correlation between perfect and progressive meaning with *te-iru*, and he attempts firstly to give an explanation as to why the two different interpretations are allowed with the same morphological affix. To summarise his account briefly here, Jacobsen’s emphasis lies on the inherent quality of *te-iru*, which he describes as its “homogeneous, unchanging fashion over a given interval of time” (Jacobsen, 1992:200). The distinction between perfect and progressive meanings stems from this inherent quality of *te-iru* interacting with the inherent properties of each verb. More concretely, when *te-iru* is attached to a verb which has a dynamic nature, like *hashiru* “run”, a progressive interpretation is allowed, that is, it presents an on-going, continuous activity. On the other hand, when *te-iru* is concerned with a static verb like *tokeru* “melt”, a perfect meaning is achieved, because it denotes the meaning of homogeneous continuity of state.

3.3.3 Comparison of the classifications by Vendler (1967) and Kindaichi (1976)

Jacobsen (1992: 167) compares the classifications proposed by Vendler (1967) and

Kindaichi (1976), and finds some affinities between them. He presents a schema to describe the relation between the classifications.

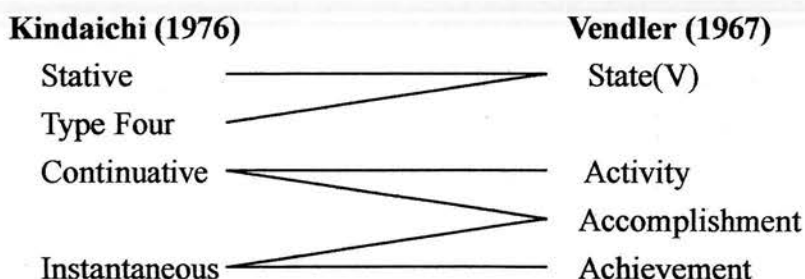


Figure 3-1: The Affinities between Vendler's and Kindaichi's Classification
(Jacobsen, 1992: 166)

Jacobsen gives some explanation of the relationship between each category. Basically, each of the pairs, Continuative and Activity, Instantaneous and Achievement, shares common characteristics, which means most of the achievement verbs in English are equivalent to the Instantaneous verbs in Japanese. The same can be said of the Activity verbs in English and the Continuative verbs in Japanese. However, there still remain some problems with this account for Accomplishments in Vendler's and Type Four in Kindaichi's. McClure (1995) also gives some discussion on these problems referring to Jacobsen's view as well. Their analyses of Kindaichi's classification share a lot of common ideas, but their opinions differ substantially in their conclusions. Here we shall review McClure's discussion briefly.

First, concerning Vendler's Accomplishments, Jacobsen (1992) and McClure (1995) agree that there are quite a few verbs in Japanese which have some ambiguity in their interpretation between perfective for achievement, and progressive for activities, though Kindaichi categorises all of them as Instantaneous (Achievements). Jacobsen suggests this will be sorted out by positing Vendler's Accomplishments in Kindaichi's analysis. However, McClure disagrees with this by arguing that if this ambiguity is widely seen in all Activity verbs, it is not meaningful to set up a separate class.

Secondly, as for the treatment of Type Four verbs, Jacobsen assumes that Kindaichi's Stative and Type Four verbs are identical to Vendler's States not in terms of the translation of lexical items, but in the inherent characteristics of the verbs in each class. However, McClure argues that Type Four verbs are not Stative which are very few, but

actually achievements according to the results of some diagnostic tests apart from the *te-iru* construction. Thus McClure concludes that only the verbs which do not allow the *te-iru* form should be regarded as “genuine” Stative, and proposes abolishing Type Four.

In spite of such differences in each view, Jacobsen and McClure’s ideas are parallel in that the three classes; States, Activities, and Achievements are fundamental in both languages.

3.3.4 The modification of Vendler (1967) and Kindaichi (1976) by McClure (1995)

As referred to in the previous section, McClure (1995) argues that in Japanese it is not worth positing a separate class of Accomplishments, because the class of Activity verbs overlaps with it. Therefore, he eliminates the class of Accomplishments, which is the same proposal as Pustejovsky (see section 2.2.3.2.3.1), and proposes a new classification as follows:

Table 3-3: The modification of Kindaichi’s(1976) Classification by McClure(1995)

States	Achievements	Activities
<i>iru</i> “need”	<i>tuku</i> ”arrive”	<i>oyogu</i> ”swim”
<i>aru</i> “have”	<i>sinu</i> ”die”	<i>aruku</i> “walk”
<i>dekiru</i> ”be able to do”	<i>niru</i> ”resemble”	<i>tegami-o kaku</i>
<i>mieru</i> “be visible”	<i>wakaru</i> “understand”	“write a letter”
		<i>doa-o akeru</i>
		“open a door”
		(McClure 1995: 73)

McClure also has a similar view of the class of Accomplishments in English. After examining the results of a few diagnostic tests, he concludes that Vendler’s and Dowty’s “Accomplishment” verbs exhibit some ambiguity in behaviour between activity and achievement. McClure concludes that Accomplishment verbs are basically Activity verbs which display ambiguous behaviour syntactically between Activity and Achievement. In using a tripartite classification, this is parallel to Verkuyl (1993). He demolishes the classes of accomplishments and achievements, and posits a new class, which is “Event” as the class opposed to “Stative” and “Process”.

For these reasons, McClure abolishes the class of Accomplishments in English as well. His modification of Vendler (1967) is as follows:

Table 3-4: The modification of Vendler's(1976) Classification by McClure(1995)

States	Achievements	Activities
need	arrive	swim
love	die	walk
understand	come	write a letter
be	learn	open a present

(McClure 1995: 73)

3.4 Summary

In the first section of this chapter, seven pieces of evidence for unaccusativity in Japanese were discussed: quantifier floating (Miyagawa 1989), resultative constructions (Tsujimura 1990a, 1990b, 1994, 1996), *te-iru* constructions (Takezawa 1991), case-marker drop (Kageyama 1993), the *takusan* construction, the *kake* deverbial nominalization, and the Sino-Japanese complex predicates. Some of the syntactic diagnostics such as quantifier floating allow constructions both with and without QF for unaccusative verbs but not for unergative verbs; unergative verbs are ungrammatical with QF. Case drop exhibits the similar optionality with unaccusative verbs, but this is a phenomenon mainly observed in spoken language, and such data is hard to find in written form. Case drop is therefore less reliable as a diagnostic of the unergative/unaccusative distinction. The *te-iru* construction and the *takusan* construction are diagnostic tests, which capture two different interpretations between unergatives/unaccusatives. Both these constructions exhibit an ambiguity in the interpretation with the peripheral verbs of the Split Intransitive Hierarchy. The resultative constructions and *kake* deverbial nominalization share the same problem - the acceptability tends to be highly influenced by the predicate which the verb is embedded in. Thus unaccusative sentences are not necessarily accepted unless the verb and the context are compatible. On the contrary, some unergative sentences turn out to be grammatical by attaching an additional phrase.

Finally, unlike the other six tests for unaccusativity, use of the Sino-Japanese complex predicate is not characterized as a diagnostic test, but it shows that not only Japanese

native verbs but also the verbs derived from imported words are also classifiable under the unergative/unaccusative distinction.

In the second section, the aspectual system in Japanese is reviewed. The similarities and difference between Kindaichi (1976) and Vendler (1967) are discussed, and the influence of these theories on McClure (1995) is also observed.

CHAPTER 4

TRANSITIVE/INTRANSITIVE VERBS IN ENGLISH AND JAPANESE

4.0 Introduction

In this chapter, transitive/intransitive verbs in English and Japanese will be compared and examined. One of the main purposes of the current study (see introduction) is to investigate whether the Split Intransitivity Hierarchy is followed by learners of Japanese as seen by learners of Romance languages. So as to carry out research to address this question, what must be done first is to examine and clarify the similarities and differences between Japanese and English verbs along the Split Intransitivity Hierarchy (Sorace 2000), and single out the most relevant pairs of English and Japanese words with the same meaning.

This chapter is divided into three parts. In the first part, monadic verbs which do not allow the transitive/intransitive alternation will be examined according to the Split Intransitivity Hierarchy presented by Sorace (2000). In the second part, based on the claims of Levin and Rappaport Hovav (1995), and Kageyama (1996), two types of dyadic verbs will be reviewed: one which allows the transitive/intransitive alternation, and another which does not. Finally, psychological verbs in Japanese will be discussed along with the review of the preceding studies on psychological verbs in English.

4.1. The classification of verbs in English and Japanese

Ultimately, it is assumed that all verbs in English fall under one of the four types listed below. Only Type 3 can participate in the intransitive/transitive alternation. The classification of English verbs shown below includes just 4 types.

Table 4-1: The classification of English verbs

Type 1: *Intransitive* - Unergative verbs

ex. *dance, cry, swim, walk, play, smile, etc.*

Type 2: *Intransitive* - Unaccusative verbs without transitive counterparts

ex. *appear, exist, arise, fall, arrive, happen, disappear, etc*

Type 3: *Intransitive/Transitive* - Unaccusative verbs with transitive counterparts

ex. *break, melt, open, sink, bend, drop, etc.*

Type 4: Transitive - Transitive verbs without intransitive counterparts

ex. *plant, clean, write, decide, see, read, build, etc.*

All verbs in Japanese can be classified according to the same 4 types. These verbs have the same semantic composition as English, but vary in that the transitive/intransitive alternation is represented with overt morphemes. That is, English manifests the alternation using an identical morphological form, while Japanese manifests the alternation using the same verbal root, but with different suffixes attached. Examples (154) and (155) illustrate this point. While the transitive and intransitive forms of 'melt' are identical in English, the Japanese counterparts have different forms: 'tokeru' is intransitive and 'tokasu' is transitive.

- (154) a. The ice **melted**. (Intransitive)
b. The hot sun **melted** the ice. (Transitive)
- (155) a. Koori ga **toketa** (Intransitive)
ice – NOM melted
“The ice melted”
b. Atui taiyou ga koori o **tokasita** (Transitive)
hot sun –NOM ice ACC melted
“The hot sun melted the ice”

Tsujimura lists further such verb pairs, and examples are shown in Table 4-2.

Table 4-2: Transitive/Intransitive Verb Pairs in Japanese (Tsujimura 1996:320)

transitive	intransitive	gloss
<i>akeru</i>	<i>aku</i>	“open”
<i>simeru</i>	<i>simaru</i>	“close”
<i>ageru</i>	<i>agaru</i>	“raise/rise”
<i>sageru</i>	<i>sagaru</i>	“lower”
<i>kowasu</i>	<i>kowareru</i>	“break”
<i>taosu</i>	<i>taoreru</i>	“[fell]/fall”
<i>okosu</i>	<i>okiru</i>	“wake”
<i>tokasu</i>	<i>tokeru</i>	“melt”

I have included some examples to illustrate.

Table 4-3: Summary of Kageyama's (1996) classification of Japanese verbs

Type 1: Intransitive - Unergative verbs

ex. *hasiru* (run), *naku* (cry), *hohoemu* (smile), *aruku* (walk), *asobu* (play)

Type 2: Intransitive - Unaccusative verbs without lexical transitive counterparts

ex. *tuku* (arrive), *kuru* (come), *saru* (leave), *tatu* (depart), *syoujiru* (occur)

Type 3: Intransitive/Transitive - Unaccusative verbs with lexical transitive counterparts

Pattern 1: Transitive+eru→Intransitive

ex. *waru/wareru* (break), *kudaku/kudakeru* (shatter), *yaburu/yabureru* (tear)
saku/sakeru (split)

Pattern 2: Transitive+aru→Intransitive

ex. *ueru/uwaru* (plant (*tran*) /plant (*int*)), *kimeru/kimaru* (decide (*tran*) /decide (*int*)),
mitukeru/mitukaru (find (*tran*) /find (*int*)), *umeru/umaru* (bury (*tran*) /bury (*int*))

Pattern 3: Intransitive+asu, osu→Transitive

ex. *kagayaku/kagayakasu* (shine, make sth shine), *okiru/okosu* (happen/make sth happen)

Type 4: Transitive - Transitive verbs without lexical intransitive counterparts

ex. *utu* (hit), *arau* (wash), *miru* (see), *yomu* (read), *nomu* (drink), *taberu* (eat)

Among these four types of verbs which are common to both English and Japanese, verbs in Type 1 and Type 2 are generally characterised as intransitive verbs which do not allow the intransitive/transitive alternation. The verbs in Type 3 allow the intransitive/transitive alternation, though they differ in the direction of derivation—that is, whether transitive variants are derived from intransitive roots or vice versa. This is examined in more detail in Section 4.2.3. The verbs in Type 4 are basically transitive verbs which do not allow an intransitive use.

In comparing English and Japanese verbs in each of the four types, Types 1 and 2, and

Types 3 and 4 will be discussed together. The former are labelled as verbs which do not allow the causative alternation—"monadic verbs", and can hence be plausibly treated together. With respect to the latter, both Type 3 and Type 4 verbs are labelled as "dyadic verbs", but in English, Type 3 verbs allow the intransitive/transitive alternation, while Type 4 do not. This fact makes us think that these two types should not be dealt with together. However, it turns out that many of the verbs in Type 4 in English are equivalent to verbs of Type 3 in Japanese, which means the number of verbs allowing the alternation is greater in Japanese than English. The details are shown in section 4.2.3. Let us start by looking at verbs in Type 1 and Type 2 in English and Japanese.

4.2 Type1 and Type 2 - without transitive counterparts: monadic verbs

Type 1 and Type 2 verbs share a common feature—they do not have a transitive variant. Type 1 consists of unergative verbs, which have a sole external argument. Type 2 consists of unaccusative verbs, which have no external argument but one internal argument in their lexical semantic representation, following Levin and Rappaport Hovav's (1995) claim. Therefore, for the sake of convenience, Type 1 and Type 2 verbs will be called monadic verbs in the following sections.

In comparing English and Japanese verbs from each type, I employ Sorace's (2000) Split Intransitivity Hierarchies (see 2.2.3.1.2 for details). These are formulated based on data from five Western European languages: Dutch, English, German, French and Italian with a view to application to other languages, so it seems appropriate to test them against a non-Western European language. When different languages are compared, there always arise some problems with finding equivalent synonyms.

In comparing Japanese and English verbs, what is to be predominantly focused on is verbs sharing the same semantic components, and associated with the same syntactic representation. In other words, they are equivalent verbs in their meaning, while retaining a constant argument structure.

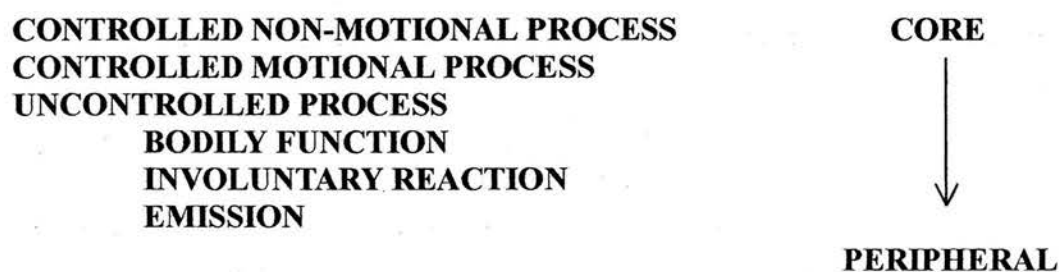
The main purpose of the application of these hierarchies verbs is to find out to what extent Japanese intransitive verbs exhibit differences from other languages in the distinction between unaccusatives and unergatives. In other words, where is the cut-off point for differentiating unaccusatives from unergatives in Japanese? The application

of Japanese verbs to the the Split Intransitivity Hierarchies is discussed in the next two subsections.

4.2.1 Type 1: Unergative verbs

First let us start looking at unergative verbs along the Split Intransitive Hierarchy (see 2.2.3.1.2). As a reminder, the unergative verb classification within the Split Intransitive Hierarchy is presented here again.

Table 4-4: The Split Intransitive Hierarchy -unergatives-



Three types of diagnostic tests which are widely regarded as evidence of unaccusativity are employed to explore the verbs' behaviour within each verb class: Quantifier floating, Resultative construction, *te-iru* construction (see 3.1 for details)

4.2.1.1 Controlled non-motional process verbs

The results from the three diagnostic tests for Controlled non-motional process verbs are shown in the following table:

Table 4-5: Controlled non-motional process verbs in Japanese

	Quantifier floating	Resultative (State) (Goal)		<i>te-iru</i> form
<i>utau</i> (sing)	*	*	*	progressive
<i>asobu</i> (play)	*	*	*	progressive
<i>shaberu</i> (talk)	*	*	*	progressive
<i>matsu</i> (wait)	*	*	*	progressive
<i>hanasu</i> (speak)	*	*	*	progressive
<i>nemuru</i> (sleep)	*	*	*	progressive

Controlled non-motional process verbs are basically agentive processes, and do not affect the entity which has control. These verbs are aspectually homogeneous, but they do not exhibit unaccusative alternations regardless of the construction they are embedded in. The following examples show that this characteristic is also shared by Controlled non-motional process verbs in Japanese.

- (158) a. Kodomo -ga hutari [_{VP} kooen de asonda]
 child -NOM two park at played
 "Two children played at the park"
 b. *Kodomo -ga [_{VP} kooen de hutari asonda]
 child -NOM park at two played
 "Two children played at the park"

- (159) a. Gakusei -ga sannin [_{VP} bed de nemutta]
 student-NOM three bed at slept
 "Three students slept in a bed"
 b. *Gakusei -ga [_{VP} bed de sannin nemutta]
 student-NOM bed at three slept
 "Three students slept in a bed"

(158a) and (159a) are grammatical having the numeral quantifier outside VP, while (158b) and (159b) are ungrammatical with the numeral quantifier inside VP. Thus Controlled non-motional process verbs in Japanese do not allow the numeral quantifier to be placed inside VP, which shows that *asobu* (play) is unergative in the structure (see 3.1.1 for the details on quantifier floating). Furthermore this cannot be changed by means of an additional phrase such as a temporal adverbial such as "*hach-ji made* (until 8 o'clock)" as shown in (160).

- (160) a. *Kodomo-ga [_{VP} kooen de yoru osoku made hutari asonda]
 child - NOM park at night late up to two played"
 "Two children played at the park until late at night"
 b. * Gakusei - ga [_{VP} bed de asa osoku made sannin nemutta]
 student -NOM bed at morning late up to three slept
 "Three students slept in a bed until late in the morning"

In section 3.1.1, we observed the case where some Controlled motional process

unergative verbs in English exhibit a property shift into unaccusative verbs by taking additional PPs that denote a "goal" of motion. Unlike this case, Controlled non-motional process verbs do not alternate into unaccusatives even if they take an adverbial phrase as in (160a) and (160b).

4.2.1.2 Controlled motional process verbs

Controlled motional process verbs denote manner of motion without specifying the direction of change. As Sorace (2000) points out, the aspectual structure of this class is more homogeneous than that of Controlled non-motional processes. The results from the three diagnostic tests for Controlled motional process verbs are presented in the following table.

Table 4-6: Controlled motional process verbs in Japanese

	Quantifier floating	Resultative (State)	(Goal)	<i>te-iru</i> form
<i>oyogu</i> (swim)	*	*	*	progressive
<i>aruku</i> (walk)	*	*	*	progressive
<i>hasiru</i> (run)	*	*	*	progressive
<i>hau</i> (crawl)	*	*	*	progressive
<i>haneru</i> (hop)	*	*	*	progressive
<i>tobu</i> (fly)	*	*	*	progressive

These verbs are also members of the "Activity" class in Vendler's system in both English and Japanese, as shown by their compatibility with the time adverbial "for an hour" in English, and *ichi-zikan* (for an hour) in Japanese, but not with "in an hour"/"*ichi-zikan de*". Compare the following examples.

(161) verbs of Controlled motional process

- a. John walked {for an hour/* in an hour}
- b. John wa {ichi-zikan/* ichi-zikan de} aruita
 John- NOM one- hour one-hour in walked
 "John walked {for one hour/ in an hour}"

(162) verbs of Change of location

- a. John arrived {*for an hour/ in an hour}
- b. John wa {*ichi-zikan / ichi-zikan de} tuita
John- NOM one hour in one hour arrived
"John arrived {for an hour/ in an hour}"

Parallel to English data in (161a) and (162a), Japanese data in (161b) and (162b) demonstrate exact equivalence: the controlled motional process verb is compatible with a *for*-phrase, but not with an *in*-phrase, while the change of location shows opposite results. As already suggested in section 2.2.2.1, this can be explained by the fact that Activities such as verbs of Controlled motional process verbs denote continuous, atelic events without having a definite end-point, which does not allow them to take time adverbials referring to a point in time *in*-, but does allow them to take *for*-. In contrast, Achievements such as verbs of Change of location denote instantaneous, telic events, which enable them to take the time adverbial *in*- but not *for*-.

Kageyama (1996:59) presents another interesting test to verify this point, which is compatibility with the adverb, "on and on" (*don don*). This adverb implies the continuation of the events which the verb denotes. Compare the following examples,

(163) verbs of Controlled motional process verbs

- a. He swam on and on.
- b. Kare wa don don oyoida
he NOM on and on swam
"He swam on and on"

(164) verbs of Change of location

- a. *He left home at eight on and on.
- b. *Kare wa ie-o hati -zi ni don don deta
he NOM home eight o'clock at on and on left
"He left home at eight on and on"

The same account as *for*- and *in*- also applies here. That is, telic, instantaneous events are not compatible with the adverb denoting the continuation of events.

Finally, Sorace (2000:877) refers to two points with characteristics which distinguish verbs of motional process from verbs of non-motional process: they show more crosslinguistic variation and more sensitivity to aspectual change in the predicate where they are embedded. Her claim is also shown to apply to Japanese. Compare the following examples:

(165) verbs of Controlled non-motional processes

- a. *Kodomo-ga [_{vp} kooen de hutari asonda]
 child-NOM park at two played
 "Two children plays at the park"
- b. *Kodomo-ga [_{vp} kooen de yo - zi made hutari asonda]
 child- NOM park at four oclock until two played
 "Two children played at the park until 4 o'clock"

(166) verbs of Controlled motional processes

- a. *gakusei-ga [_{vp} yukkuri sannin oyoida]
 student NOM slowly three swam
 Three students slowly swam to the island
- b. Gakusei-ga [_{vp} yukkuri sima-made sannin oyoida]
 student-NOM slowly island-as far as three swam
 "Three students slowly swam to the island"

In (166), the additional goal phrase functioning as an event delimiter makes the interpretation more acceptable, while in (165), the additional time adverbial also functioning as an event delimiter does not make the interpretation acceptable. This supports Sorace's claim that verbs of motional process show more sensitivity to aspectual changes.

Thus, Controlled motional process verbs exhibit clear differences from directed motion verbs, which are achievements, in their compatibility with time adverbials such as English "for an hour" and "in an hour". In addition, alternative syntactic phenomena show the difference between those two aspectual classes of verbs, as presented by Kageyama (1996), concerning whether they allow continuation as illustrated in (163b) and (164b).

4.2.1.3 Uncontrolled (Non-volitional) process verbs

Sorace (2000: 877) characterises this class of verbs as denoting "stative, non-dynamic activities", "a low degree of volitional energy", "more density and more homogeneity" than the other two classes of unergatives, and a "high degree of subject affectedness".

This class include verbs denoting uncontrolled process, non-volitional process, and emission. Examples of each class are shown in Table 4-7.

Table 4-7 : Uncontrolled (Non-volitional) process verbs in Japanese

	Quantifier floating	Resultative (State)	Goal	<i>te-iru</i> form
<bodily function>				
<i>haku</i> (vomit)	*	*	*	progressive
<i>sekikomu</i> (fitfully cough)	*	*	*	progressive
<i>asebamu</i> (sweat)	*	*	*	resultative
<involuntary reaction>				
<i>hurueru</i> (shiver)	*	*	*	progressive
<i>yureru</i> (tremble)	*	*	*	progressive
<i>guratuku</i> (waver)	*	*	*	progressive
<emission>				
<i>hikaru</i> (flash)	OK	*	*	progressive
<i>kagayaku</i> (shine)	OK	*	*	progressive
<i>naru</i> (ring)	OK	*	*	progressive

According to Sorace's account these four classes of verbs share the same characteristic, which is "lack of volitionality". This is demonstrated by their awkwardness with the phrase "on purpose". However, Sorace (2000:877) points out that for involuntary bodily functions, the phrase "on purpose" is sometimes possible:

- (166) a. Mario ha tossito apposta per attirare l'attenzione
 Mario has coughed on purpose to attract the attention
 "Mario coughed on purpose to attract attention"

In Japanese, the equivalent verb for "cough" is transitive; *seki-o-suru* (cough), but the

synonym *sekikomu* (cough fitfully) is intransitive, and can take the phrase *wazato* (on purpose). Apart from this exception, other involuntary bodily function verbs cannot occur with the phrase "on purpose", thereby showing a complete lack of volitionality, parallel to Sorace's claim for European languages.

- (167) a. ?Tom ga wazato haita
 Tom NOM intentionally vomited
 "Tom vomitted intentionally"
 b.* John ga wazato asebanda
 John NOM intentionally sweated
 "John intentionally sweated"

With respect to the nonvolitional process verbs in Italian, Sorace (2000:877) claims that they show sensitivity to the animacy of the subject, that is, auxiliary *avere* is prepared with animate agent as shown in (168) and (169).

- (168) a. La fede religiosa ha tentennato/?? è tentennata anche nei piu forti
 the faith religious has wavered / is wavered even in the strongest
 "The religious faith wavered even in the strongest people"
 b. Paolo ha tentennato/è* tentennato a lungo prima di decidersi
 Paolo has wavered/is wavered for long before of decide-self
 "Paolo wavered for a long time before he made up his mind."

In Japanese the equivalent verb for 'waver' or 'wobble' exhibits a similar tendency. Look at the following examples, which are tested with quantifier floating.

- (169) a. Musiba - ga nihon gohan-no ato guratuita
 decayed tooth-NOM two meal-GEN after wobbled
 "Two decayed teeth wobbled after the meal"
 b. Musiba - ga gohan-no ato nihon guratuita
 decayed tooth-NOM meal-GEN after two wobbled
 "Two decayed teeth wobbled after the meal"
- (170) a. Taiso sensyu -ga hutari heikindai - no ue-de guratuita
 gymnast- NOM two balance beam NOM on wobbled
 "Two gymnasts wobbled on the balance beam"

- b.* Taiso sensyu -ga heikindai - no ue-de hutari guratuita
 gymnast- NOM balance beam NOM on two wobbled
 "Two gymnasts wobbled on the balance beam"

As shown in (169b) and (170b), *guratuku* (wobble) does not allow quantifier floating with human subjects, while the verb shows more acceptability with inanimate subjects such as "tooth".

4.2.2 Type 2: Unaccusative verbs

Let us move on to the unaccusatives along the Split Intransitivity Hierarchy. Recall the unaccusative verb classification within the Split Intransitivity Hierarchy (see 2.2.3.1.2 for details).

Table4-8: The Split Intransitivity Hierarchy-unaccusatives-

CHANGE OF LOCATION	CORE ↓
CHANGE OF CONDITION	
DIRECTED MOTION	
CHANGE OF STATE	
APPEARANCE	
CONTINUATION OF A PRE-EXISTING CONDITION	
EXISTENCE OF A STATE	
CONCRETE STATES	
SIMPLE POSITION	
ABSTRACT/PSYCHOLOGICAL STATES	
	PERIPHERAL

4.2.2.1 Change of location verbs

Sorace (2000:863) explains that Change of location verbs denote the highest degree of dynamicity and telicity, which display unaccusative characteristics the most strongly. Thus, this class of verbs is identified as the core of unaccusativity. Let us look at Change of location verbs in Japanese to see whether her description for this verb class in European languages also applies to Japanese.

Table 4-9: Change of location verbs in Japanese

	Quantifier floating	Resultative (State)	(Goal)	<i>te-iru</i> form
<i>tuku</i> (arrive)	OK	*	OK	resultative
<i>kuru</i> (come)	OK	*	OK	resultative
<i>deru</i> (exit)	OK	*	OK	resultative
<i>hairu</i> (enter)	OK	*	OK	resultative
<i>modoru</i> (return)	OK	*	OK	resultative
<i>saru</i> (leave)	OK	*	OK	resultative
<i>tatu</i> (depart)	OK	*	OK	resultative

Change of Location verbs in Japanese follow the behaviour of those in European languages demonstrated by Sorace in that they denote the highest degree of dynamicity and telicity. This is shown by the compatibility with *ichi-zikan de* (in an hour) and incompatibility with *ichi-zikan* (for an hour).

Recall the discussion in section 4.2.1.2. The Change of location verbs denote instantaneous and telic events, which does not allow them to take adverbs implying the continuation of events, but the adverbs referring to a point in time. For example, a Change of location verb "*modoru*" (return) can take - in, but not - for.

- (171) a. Mary returned {*for an hour/in an hour}
 b. Mary wa {*ichi-zikan/ ichi-zikan de} modotta
 Mary-NOM one hour one hour in returned
 "Mary returned {for an hour/ in an hour}"

In Italian and English, "*arrivare* (arrive)" can cooccur with "*per ore* (for hours)" to describe repetitive arrival of guests- in the sense that many guests arrived one after another for hours. The example (172) is provided by Sorace (2000:864):

- (172) a. Guests arrived for hours.
 b. Sono arrivati ospiti per ore e ore
 are arrived guests for hours and hours
 "Guests arrived for hours"

Change of location verbs in Japanese share some characteristics with English. Thus in (176a), Taro's arrival is with respect to the location: the station— but not with respect to his physical condition as shown in (176b).

- (176) a. Taro ga eki - ni tuita
Taro-NOM station at arrived
"Taro arrived at the station"
- b. *Taro ga kutakuta-ni tuita
Taro-NOM exhausted arrived
"Taro arrived exhausted"

The results from the three diagnostic tests show that these verbs are strongly unaccusative, which is parallel to Sorace's (2000) claim, that auxiliary BE is always selected by telic change of location verbs, cross-linguistically. This is independent of the agentivity of their subject, and also of the aspectual contribution of any other adjuncts in the predicate.

4.2.2.2 Change of condition verbs

Sorace assumes that the notion of directed change verbs from Levin and Rappaport Hovav (1995) should be further divided into two, one specifying a telic endpoint, and another which does not. In the Unaccusative Hierarchy, the former are categorised as "Change of location verbs" which have already been discussed, while the latter are classified as "Change of condition verbs"

Table 4-10 : Change of condition verbs in Japanese

	Quantifier floating	Resultative (State)	Goal	<i>te-iru</i> form
<directed motion>				
<i>noboru</i> (ascend)	OK	*	OK	pro/res
<i>oriru</i> (descend)	OK	*	OK	pro/res
<i>agaru</i> (rise)	OK	*	OK	pro/res
<i>sagaru</i> (decline)	OK	*	OK	pro/res
<change of state>				
<i>kusaru</i> (rot)	OK	OK	*	resultative
<i>saku</i> (bloom)	OK	OK	*	resultative
<i>kutiru</i> (decay)	OK	OK	*	resultative
<i>sabiru</i> (rust)	OK	OK	*	resultative
<i>hukuramu</i> (swell)	OK	OK	*	resultative
<i>sioreru</i> (wilt)	OK	OK	*	resultative
<appearance>				
<i>arawareru</i> (appear)	OK	*	*	resultative
<i>kieru</i> (disappear)	OK	*	*	resultative
<i>okoru</i> (happen)	OK	*	*	resultative
<i>syouziru</i> (arise)	OK	*	*	resultative

Based on Sorace's claim, Change of condition verbs are characterised as "indefinite change" verbs, which are verbs denoting directed movement without specifying the achievement of a final state such as *rise* (verb of directed motion), *rust* (verb of change of state). These verbs "imply a series of interim states and of gradual approximation to a telos which is not necessarily reached"(Sorace 2000:864-865). Sorace points out that there are gradients within the domain of telicity, which is also suggested by Bertinetto (1997) and Borer (1994). Thus, Change of condition verbs can be considered to be a kind of telic verb, but they denote a lower degree of telicity than Change of location. As one piece of evidence to exemplify this fact, Sorace shows the compatibility of these verbs with phrases which do not contain a 'measure' such as "begin to -".

- (177) a. The wood began to decay.
 b. The temperature began to rise.
 c. * The train began to arrive.
 d. * My friend began to leave.

(Sorace 2000:865)

As presented in (177a) and (177b), the Change of condition verbs decay and rise are compatible with begin. However, (177c), (177d) show that the Change of location verbs such as arrive, and leave are incompatible with "begin to-".

This different syntactic behaviour with the phrase 'begin to-' between Change of condition verbs and Change of location verbs is also detected in Japanese.

- (178) a. Ki ga kuti -hazimeta.
 Wood - NOM decay began
 "The wood began to decay"
- b. Kion ga agari – hazimeta
 temperature -NOM rise began
 "The temperature began to rise"
- (179) a. * Ressya ga tuki - hazimeta
 train - NOM arrive began
 "The train began to arrive"
- b. *Tomodati ga sari - hazimeta
 friend - NOM leave - began
 "My friend began to leave"

These examples show that Change of condition verbs in Japanese also exhibit lower telicity than change of location verbs. This telicity characteristic of Change of condition verbs is confirmed by the results of the *te-iru* tests applied to directed motion verbs - a subset of the Change of Condition verbs.

As shown in the table, verbs of directed motion in Japanese exhibit an ambiguity in their interpretation between progressive and perfective, which means they can be

interpreted as both telic and atelic. However, the other two categories, which are verbs of change of state and verbs of appearance, present consistent results in the *te-iru* form. The verbs in these categories never show ambiguity in their interpretation in the *te-iru* form. Judging from the results of this test, verbs of change of state and verbs of appearance seem to imply more telicity than verbs of directed motion.

Turning our focus to the results of the resultative phrase test, however, these show some variance with the discussion about telicity which is mentioned above. The results show that verbs of appearance do not allow any type of resultative phrase: neither the one specifying a goal nor one specifying a change of state, while verbs of directed motion and verbs of change of state allow either a goal phrase or a change of state phrase, illustrated as follows:

(180) directed motion

- a. Guntai - ga kawa-made susunda (Goal)
 army -NOM river-as far as advanced
 "The army advanced to the river"
- b. * Guntai - ga kutakuta -ni susunda (State)
 army - NOM tired advanced
 "The army advanced tired"

(181) appearance

- a. *John -ga eki-made arawareta (Goal)
 John-NOM station-as far as appeared
 "John appeared to the station"
- b. *John- ga kutakuta-ni arawareta (State)
 John-NOM tired appeared
 "John appeared, tired"

(182) change of state

- a. *Husen ga tenzyo made hukureta (Goal)
 balloon NOM sealing to swelled
 "*The balloon swelled to the sealing"
- b. Husen ga ookiku hukureta (State)
 balloon NOM big swelled
 "The balloon swelled big"

As already seen in section 4.2.2.1, Tenny's "Single Delimiting Constraint (SDC)" cannot give a proper account here. Tortora (1998) gives the following sentences to exemplify this fact.

- (183) a.* The gas rose cool.
b.* The meteorite fell hot.

(Tortora 1998:340)

- (184) a. The bottle broke open. (Levin and Rappaport Hovav 1995:59)
b. The wedding cake melted into a slimy mess. (Tortora 1998:342)

(183a) and (183b) violate the SDC in the sense that verbs of directed motion such as *rise*, *fall* are not compatible with the resultative state phrase, even though they are not lexically delimited. Contrary to this, (184a) and (184b) "violate" the SDC, because verbs of change of state are compatible with resultative state phrase, in spite of being lexically delimited.

Tortora (1998) points out the problems with Tenny's SDC, and presents a "Further Specification Constraint (FSC)", which states that "a verb that is inherently delimited may occur with a resultative, so long as the resultative acts as a further specification of the result already inherent in the verb's meaning" (Tortora 1998:341). The point is that the verb's compatibility with the resultative depends on whether the result specified is inherent in the verb's meaning. Based on this idea, the ungrammaticality of (183a) and (183b) can be explained by the fact that the resultative state phrases like *cool* and *hot* are not inherent in the meaning of verbs such as *rise* and *fall*, respectively. The idea behind Tortora's FSC seems to be parallel to Goldberg (1995). She also gives a criticism for Tenny's SDC, and proposes the Unique Path Constraint (UPC) as follows:

- (185) **Unique Path (UP) Constraint:** If an argument X refers to a physical object, then no more than one distinct path can be predicted of X within a single clause. The notion of a single path entails two things: (1) X cannot be predicted to move to two distinct locations at any given time *t*, and (2) the motion must trace a path within a single landscape. (Goldberg 1995: 82)

To explain the notions of "distinct path", and "landscape", Goldberg gives the following example:

(186) *The vegetables went from crunchy into the soup.

(Goldberg 1995: 83)

Goldberg's account for the ungrammaticality of (186) is that this example mixes two different types of notion - literal and metaphorical. To borrow her term, the subject "the vegetables" paths a different "landscape".

In the same way, the reason why a resultative stative phrase cannot occur with a verb of directed motion as seen in (183) can be explained. That is, verbs of directed motion inherently encode a change of physical location in their lexical meaning, therefore, they are not allowed to take on a different type of change, such as a change of state which is not encoded in it. Otherwise, the condition in UPC would be violated - "the motion must trace a path within a single landscape". These constraints by Tortora and Goldberg are also applicable to Change of condition verbs in Japanese as already exemplified in (180), (181), (182).

4.2.2.3 Continuation of condition verbs

Sorace (2000) suggests that most Continuation of condition verbs can be categorized as "Statives", characterised by non-dynamicity and stativity, just like Existence of state verbs. However, she distinguishes Continuation of condition verbs from Existence of state verbs by showing one crucial difference between them, that is, "a degree of stativity". Look at the examples in Table 4-11.

Table 4-11 : Continuation of condition verbs in Japanese

	Quantifier floating	Resultative (State)	Resultative (Goal)	<i>te-iru</i> form
<pre-existing>				
<i>todomaru</i> (stay)	OK	*	*	resultative
<i>tuduku</i> (continue)	OK	*	*	progressive
<i>motu</i> (last)	OK	*	*	resultative
<i>nokoru</i> (remain)	OK	*	*	resultative

Sorace's claim is that Continuation of condition verbs semantically encode the notion of the negation of change, while Existence of state verbs do not. That is, Continuation of condition verbs entail lesser stativity, because they denote "the implicit point of

departure of the action whose continuation is described" (Sorace 2000:867). This is also described by each semantic representation.

- (187) a. **<Continuation of condition>**Y continues to be in a pre-existent CONDITION
b. **<Existence of state>** Y is in a certain CONDITION

According to the Vendler/Dowty tests, apart from some exceptions, pure statives do not allow the progressive form, adverbial prepositional phrases with "in -", and the cooccurrence of condition verbs. Let us look at the behaviour of Continuation of condition verbs with these phrases.

- (188) **The progressive form:**
a. Tom was staying at home.
b. The meeting is continuing.
c. John is remaining silent.
- (189) **adverbial prepositional phrase "in -"**
a. *Tom stayed at home in two hours.
b. *The meeting continued in two days.
c. *John remained silent in two minutes.
- (190) **cooccurrence as complements of "finish"**
a. *Tom finished staying at home.
b. *The meeting finished continuing.
c. *John finished remaining silent.

Example (188) shows that unlike concrete state verbs, Continuation of condition verbs take the progressive form, while they do not allow the adverbial prepositional phrase "in <time period>" as in (189), and the occurrence of "finish" as in (190), also seen in concrete state verbs. This confirms the lower degree of stativity of Continuation of condition verbs.

The main characteristic of Continuation of condition verbs in Japanese is that they are not Statives, as shown by the results of the "*te-iru*" test – Continuation of condition verbs can cooccur with the *te-iru* form in the perfective reading, as already suggested in section 3.1.3. In Japanese, of the four classes (i.e. State, Activity, Achievement,

Accomplishment), only Stative verbs cannot take the *te-iru* form. In fact, Japanese has only a limited number of Stative verbs (e.g. *iru*: be, *aru*: be and *iru*:need).

If these verbs are not Stative, then which aspectual class might they fall under? To answer this question, let us apply further diagnostic tests which McClure (1995:66) adopted from Moriyama (1988). These use five different criteria: (a) — *hajimeru* (begin to —), (b)— *tudukeru* (continue —), (c) *sanjikan kakatte* (take three hours), (d) *sanjikan* — (for three hours), and (e) *te-iru* with perfective/ progressive interpretation.

(191) *todomaru* (stay)

a. **todomari-hazimeru* (begin to stay)

- ex. *Kyaku –ga yado-ni todomari-hazime -ta
 guest-NOM inn-at stay – begin –PAST
 “*The guest begun to stay at the inn”

b. *todomari-tsudukeru* (continue staying)

- ex. Kyaku –ga yado-ni todomari-tuduke -ta
 guest-NOM inn-at stay – continue –PAST
 “The guest continued staying at the inn”

c. **sanjikan kakatte todomaru* (stay taking three hours)

- ex. *Kyaku –ga yado-ni sanzikan kakatte todomat-ta
 guest-NOM inn-at three hours taking stay –PAST
 “*The guest stayed at the inn taking three hours”

d. *sanjikan todomaru* (stay for three hours)

- ex. Kyaku –ga yado-ni sanzikan todomat -ta
 guest-NOM inn-at for three hours stay –PAST
 “The guest stayed at the inn for three hours”

e. allows *te-iru* with perfective interpretation

- ex. Kyaku –ga yado-ni todomatte-iru
 guest-NOM inn-at stay – be
 “The guest has stayed at the inn”

(192) *tuduku* (continue)

a. **tuduki-hazimeru* (begin to continue)

- ex. *Kaigi-ga tuduki-hazime-ta
 meeting-NOM continue-begin-PAST
 “*The meeting began to continue”

b. -----

c. ***sanzikan kakatte tuduku (continue taking three hours)**

ex. *Kaigi-ga sanzikan kakatte tudui - ta
 meeting-NOM three hours taking continue-PAST
 “*The meeting continued taking three hours”

d. **sanzikan tsuduku (continue for three hours)**

ex. Kaigi-ga sanzikan tudui - ta
 meeting-NOM for three hours continue-PAST
 “The meeting continued for three hours”

e. **allows *te-iru* with progressive interpretations**

ex. Kaigi - ga tuduite-iru
 meeting-NOM continue - be
 “The meeting is continuing.”

(193) ***motu* (last)**

a. ****moti-hazimeru* (begin to last)**

ex. *Battery -ga moti-hazime-ta
 battery-NOM last -begin -PAST
 “*The battery begin to last”

b. ***moti-tudukeru* (continue lasting)**

ex. Battery -ga moti-tuduke-ta
 battery-NOM last -continue -PAST
 “*The battery continued lasting”

c. ***sanzikan kakatte motu (last taking three hours)**

ex. *Battery -ga sanzikan kakatte mot-ta
 battery-NOM three hours taking last -PAST
 “*The battery lasted taking three hours”

d. **sanzikan motu (last for three hours)**

ex. Battery -ga vsanzikan mot-ta
 battery-NOM for three hours last -PAST
 “The battery lasted for three hours”

e. **allows *te-iru* with perfective interpretation**

ex. *Battery -ga motte-iru
 battery-NOM last -be
 “The battery has lasted”

(194) *nokoru* (remain)

a. **nokori-hazimeru* (begin to remain)

- ex. *Seito - ga kyousitu-ni nokori-hazime-ta
student-NOM classroom-at remain-begin-PAST
“*The student begun to remain in the classroom”

b. *nokori-tudukeru* (continue remaining)

- ex. Seito - ga kyousitu-ni nokori-tuduke-ta
student-NOM classroom-at remain-continue-PAST
“The student continued remaining in the classroom”

c. **sanzikan kakatte nokoru* (remain taking three hours)

- ex. *Seito - ga sanzikan kakatte kyousitu-ni nokot-ta
student-NOM three hours taking classroom-at remain-PAST
“*The student remained in the classroom taking three hours”

d. *sanzikan nokoru* (remain for three hours)

- ex. Seito - ga sanzikan kyousitu-ni nokot-ta
student-NOM for three hours classroom-at remain-PAST
“The student remained in the classroom for three hours”

e. allow *te-iru* with perfective interpretation

- ex. Seito - ga kyoushitsu-ni nokotte-iru
student-NOM classroom-at remain-be
“The student has remained in the classroom”

These tests indicate that these verbs have some of the same characteristics that Stative verbs have - neither of them allow (a) *hazimeru* (begin to-) and (c) *sanzikan kakatte* (take two hours). The only difference between them is that Continuation of condition verbs can take *te-iru* form, while Statives cannot. Synthesising these facts, these verbs can be included into a kind of Statives like the English verbs such as *live*, *stand*, *be*, but these English Stative verbs allow the progressive form depending on the context.

4.2.2.4 Existence of state verbs

Existence of state verbs are positioned at the most peripheral part of the Split Intransitivity Hierarchy. This class of verbs are characterised as “verbs denoting simple existence imply no change component at all” (Sorace 2000:869). Existence of state verbs include classes of verbs such as concrete states, simple position and abstract or psychological states. Look at the examples for each class shown in Table 4-12.

Table 4-12 : Existence of state verbs in Japanese

	Quantifier floating	Resultative (State)	Resultative (Goal)	<i>te-iru</i> form
<concrete states>				
<i>aru</i> (be)	OK	*	*	*
<i>sonzai-suru</i> (exist)	OK	*	*	*
<i>iru</i> (need)	OK	*	*	*
<simple position>				
<i>suwaru</i> (sit)	*	*	*	resultative
<i>yokotawaru</i> (lie)	*	*	*	resultative
<i>motareru</i> (lean)	*	*	*	resultative
<i>syagamu</i> (crouch)	*	*	*	resultative
<abstract/psycho- logical states>				
<i>maniau</i> (suffice)	*	*	*	resultative
<i>okoru</i> (happen)	*	*	*	pro/res
<i>yorokobu</i> (please)	*	*	*	progressive
<i>omoeru</i> (seem)	*	*	*	progressive

According to Sorace (2000), the Existence of state verbs exhibit a crosslinguistic variation on the hierarchy. Even though there is a preference for *essere* in Italian, native judgments tend to be less determined on this class of verbs.

In Japanese, the majority of this class of verbs exhibit aspectual differences from other languages. For example, simple position verbs which are statives in English are aspectually categorised as achievements in Japanese. In Japanese, stative verbs are by non-stative achievement verbs used in the *te-iru* form in the resultant stative reading (resultative).

- (195) a. *suwaru* “sit down” (achievement)”
 John ga isu-ni suwatte-iru
 John NOM chair-on sit-be
 “John sits on the chair”

b. *tatu* “stand up” (achievement)

Dôzô ga kôen-ni tattte-iru

statue NOM park-at stand-be

“The statue stands in the park”

As mentioned in 3.3, there are only a limited number of stative verbs in Japanese (ex. *aru* “be”, *mieru* “visible”, *iru* “be”). That is why the Japanese verb which belong to this class exhibit such aspectual differences from other languages. This fact supports Sorace’s (2000:870) claim that “The closer a verb is to the stative end of the hierarchy, the more aspectually underspecified it is, and the more variation it displays”.

4.2.3 Type 3 and Type 4-with transitive counterparts, and without intransitive counterparts: dyadic verbs.

4.2.3.1 The lexical representation of dyadic verbs in Levin and Rappaport Hovav (1995) and Kageyama (1996)

Levin and Rappaport Hovav (1995) try to answer questions such as: What kind of properties of a verb’s meaning determines whether it allows the causative alternation? and What is the mechanism of the alternation like? In other words, how can an intransitive alternant be derived from a dyadic verb predicate?

The key to their answer to the first question is the notion of internal/external causation, which we have already seen in 2.2.3.1.1. This notion involves whether the eventuality is brought about internally or externally. They explain that internally caused verbs such as *laugh*, *decay* are inherently monadic, while externally caused verbs such as *break*, *open* are dyadic. The lexical semantic representation of each type is schematised below.

a. **break:** [[x **DO-SOMETHING**]CAUSE[y **BECOME *BROKEN***]]

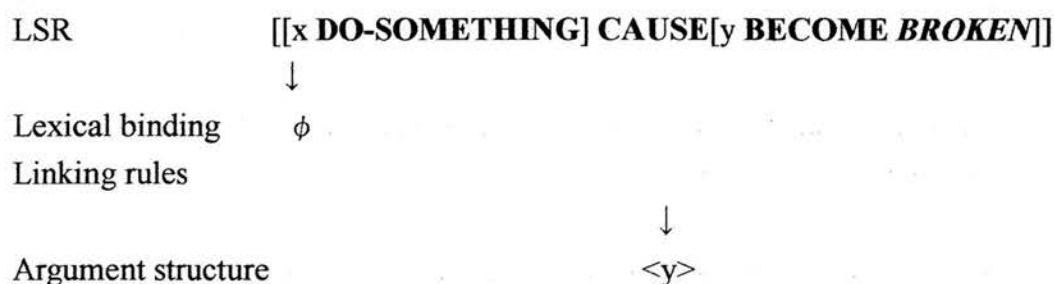
b. **laugh:** [x ***LAUGH***]

(Levin and Rappaport Hovav 1995: 94)

Internally caused verbs already have a single argument which is responsible for bringing about the eventuality, and there is no need to add another external cause. This is why they do not participate in the causative alternation.

Externally caused verbs are dyadic and basically transitive, but whenever this kind of eventuality is seen to occur without an obvious agent, the external cause is not needed to be expressed in the syntax. In such cases, the external cause is bound in the mapping from the lexical semantic representation to argument structure, as shown in (196) and (197). Hence, it is not projected onto the syntax, though the external cause still exists within the lexical semantic representation.

(196) Intransitive *break*



(197) Transitive *break*



(Levin and Rappaport Hovav 1995: 108)

In contrast, there are some externally caused verbs which do not allow an intransitive variant such as the verbs of Type 4. Those transitive verbs that never detransitivise lexically specify the entity as the external cause, which cannot be bound at the lexical semantic level. Thus, they always require that the external cause be projected onto syntax as a subject. As a result, Levin and Rappaport Hovav add another condition the class of alternating verbs, in addition to the characteristic of external causation—“a complete lack of specification of the causing event” (Levin and Rappaport Hovav 1995: 107), so that the external cause remains unspecified. They take *break* and *cut* as the examples, and explain that on the one hand, verbs like *break* specify only the result state and let the causing event remain unspecified, so enabling it to alternate. On the other hand, verbs like *cut* specify both the result state and the causing event, and so preventing them from alternation. This explains why transitive verbs which always denote an intentional, volitional agent such as “catch”, “plant”, “find” can never allow an intransitive use. A similar account has been presented by Haspelmath (1993). He

generalises the condition as follows:

- (198) A verb meaning that refers to a change of state or going-on may appear in an inchoative/causative alternation unless the verb contains agent-oriented meaning components or other highly specific meaning components that make the spontaneous occurrence of the event extremely unlikely.

(Haspelmath 1993:94)

However, as far as Japanese are concerned, this is not the case. These accounts and generalisation by Levin and Rappaport Hovav and Haspelmath cannot be applied any more to the intransitive/transitive alternation in Japanese verbs. Let us now move on to Japanese verbs of Type 3 and 4.

In Japanese, many verbs which are equivalent to verbs of Type 4 in English allow an intransitive use. The examples above, “catch” (*tukamaeru/tukamaru*), “plant” (*ueru/uwaru*), “find” (*mitukeru/mitukaru*) are examples:

- (199) Hannin ga tukamat-ta
criminal NOM catch-PAST
“The criminal caught (*int*).”

- (200) Koon ni sakura ga uwat-ta
park at cherry blossom NOM plant-PAST
“A cherry blossom planted (*int*) at the park.”

- (201) Saifu ga mitukat-ta
wallet NOM find-PAST
“*The wallet found (*int*)”

As discussed already, there are quite a few English transitive verbs without intransitive counterparts whose equivalents allow an intransitive variant in Japanese. Kageyama (1996) classifies Type 3 verbs further into three subgroups according to the suffix⁷, but he suggests that his classification shows not only a morphological difference

⁷As referred to in section 1 in this chapter, Japanese has significant variation in the verb ending, which is not very systematic. Therefore, it does not seem to be appropriate to categorise verbs according to the suffix, because it will create confusion. Kageyama himself admits this point, and makes the excuse that all the examples which he gives here are only a subset of the total.

but also a difference of semantic properties and derivations. Let us review his subclassification of Type 3 verbs again.

Type 3: Intransitive/Transitive-Unaccusative verbs with lexical transitive counterparts

Pattern 1: Transitive+eru→Intransitive

ex. *waru/wareru* (break), *kudaku/kudakeru* (shatter), *yabureru/yaburu* (tear)
saku/sakeru (split)

Pattern 2: Transitive+aru→Intransitive

ex. *ueru/uwaru* (plant (*tran*) /plant (*int*)), *kimeru/kimaru* (decide (*tran*) /decide (*int*)),
mitukeru/mitukaru (find (*tran*) /find (*int*)), *umeru/umaru* (bury (*tran*) /bury (*int*))

Pattern 3: Intransitive+asu, osu→Transitive

ex. *kagayaku/kagayakasu* (shine, make sth shine), *okiru/okosu* (happen/make sth happen)

The first pattern shows cases where the intransitive form is derived from the transitive variant by attaching the suffix *-eru*. In the second pattern, the intransitive form is derived from the transitive variant by attaching the suffix *-aru*. The third pattern is claimed basically not to exist in English, and shows a derivation from intransitive to transitive by attaching suffixes such as *-asu* and *-osu*. Since the morphological difference in Pattern 3 is not the focus of discussion here, verbs with these suffixes are treated within one category regardless of the morphological difference.

Kageyama (1996) points out the interesting fact that English has intransitive/transitive pairs which are equivalent to Pattern 1, while it does not have an equivalent for Pattern 2, which are in English transitive verbs without intransitive counterparts. A similar idea has been also presented by Jacobsen (1992), which classifies Japanese verbs according to the difference in suffixes, and notices the fact “a considerable number of pairs in this class have intransitive members glossed in English as passives” (Jacobsen 1992:80)

Kageyama also presents an analysis of the derivation of the verbs in patterns 1 and 2, and suggests that each of these patterns differ in the mapping process. According to his explanation, Pattern 1 is characterised as “anti-causativisation”- detransitivisation by identifying the external cause with the theme itself. He gives the lexical semantic

representation of the anti-causativisation as follows:

- (202) x **CONTROL** [y **BECOME** [y **BE** **AT-z**]]
 $\rightarrow x=y$ **CONTROL** [y **BECOME** [y **BE** **AT-z**]]

In contrast, Pattern 2 is characterised as “decausativisation”, parallel to what Levin and Rappaport Hovav propose for the derivation of an intransitive variant from dyadic verbs such as *break*, *open* (See (196) and (197)). Kageyama presents the representation as follows:

- (203) x **CONTROL** [y **BECOME** [y **BE** **AT-Z**]]
 \downarrow
 ϕ

Kageyama’s (1996) and Levin and Rappaport Hovav’s ideas on detransitivisation basically share the same concept of “suppression”⁸, which means that one argument is lexically bound before argument structure, and is not projected onto syntax. At this point, it would be useful to briefly explain the concept “suppression”.

The notion of “suppression” is not a new idea, but has widely been used along with other synonyms such as “zero”, “null”, “implicit”, “optional”, “absorbed”, and “understood argument”. “They all refer to the same concept of a semantically present but unprojected argument” (van Hout 1996: 43). Grimshaw (1990) uses the concept of “suppression” in the analysis of passive and reflexive cliticisation in French, and she differentiates passive verbs from reflexive verbs in that suppression in the former does not involve lexical binding, but in the latter it does. Therefore the suppressed position in passives still exists in the argument structure in spite of not being directly represented in the syntax, while the external argument in reflexive verbs is not realised in argument structure. Grimshaw’s use of “suppression” is consistent with Levin and Rappaport Hovav’s and Kageyama’s usage, but there is a fundamental difference between their ideas - Grimshaw puts the focus of her discussion on argument structure, while Levin and Rappaport Hovav and Kageyama are mainly concerned with the level of lexical semantic representation.

⁸Levin and Rappaport Hovav do not use the term “suppression”, but just describe the same concept with the phrase “the binding of a position in the lexical semantic representation prevents the projection of that position to argument structure” (Levin and Rappaport Hovav 1995:108).

Now, let us go back to Kageyama's analysis of detransitivisation. As referred to in the previous paragraph, Kageyama's view is basically parallel to Levin and Rappaport Hovav's in his claim that detransitivisation is derived as a result of "suppression", in other words, all of them agree that "alternation is determined by whether or not the causer is projected onto syntax" (Levin and Rappaport Hovav 1995: 84). However, Kageyama's and Levin and Rappaport Hovav's ideas clearly differ in the interpretation of the derivation in the lexical semantic representation.

As seen in (202) and (203), Kageyama further divides detransitivisation into two types according to the method of suppression at the level of lexical semantic representation: identifying the external cause with the theme itself (anti-causativisation), and binding the external cause, or "making the external cause implicit (decausativisation)", while Levin and Rappaport Hovav define binding of the external cause as the only method of suppression.

This leads to another difference between the two hypotheses for detransitivisation in particular cases: Kageyama argues that the verbs in Pattern 1 such as "open (*aku/akeru*)", "break (*kowareru/kowasu*)", "melt (*tokeru/tokasu*)" in Japanese and English should be explained by anti-causativisation, which contrasts with the decausative explanation of Levin and Rappaport Hovav's. Kageyama suggests that, instead, decausativisation should be applied to the verbs in Pattern 2 like "*ueru/uwaru* (plant (*tran*)/plant (*int*)), *kimeru/kimaru* (decide (*tran*)/decide (*int*)), *mitukeru/mitukaru* (find (*tran*)/found (*int*)), for which intransitive equivalents do not exist in English. Kageyama does not give a clear reason for this, but it seems to be explained by the problem which the notion "externally caused", proposed by Levin and Rappaport Hovav, seem to have. Look at the following examples for Pattern 1 verbs in English and Japanese.

(204) a. The plate broke by itself.

b. Sara ga hitoride-ni ware- ta
 plate NOM itself- by break-PAST

(205) a. The door opened by itself.

b. Doa ga hitoride-ni ai - ta
 door NOM itself -by open-PAST

(206) a. The boat sank by itself.

b. Booto ga hitoride-ni shizunn-da
boat NOM itself-by sink-PAST

(Levin and Rappaport Hovav 1995: 88, the equivalents in Japanese are mine)

In both examples in Japanese and English, these verbs can take the phrase “by itself (*hitoride-ni*)”. As Levin and Rappaport Hovav point out, if we assume that the intransitive use of the verbs such as “break”, “sink”, “open” is derived from the transitive use by lexically binding the external cause, this makes it difficult to explain why these verbs can be compatible with “by itself (*hitoride-ni*)”. This is because to lexically bind the external cause still allows its implicit existence, so it is contradictory that the verbs which always imply an external cause can appear with the phrase “by itself” at the same time. Compare the following examples:

(207) a.* The criminal was caught by himself.

b.* Hannin ga hitoride-ni tukamat-ta
criminal NOM himself-by catch-PAST
“The criminal caught (*int*) by himself.”

(208) a.* A cherry blossom tree was planted in the park by itself.

b.* Sakura ga kouen-ni hitoride-ni uwat-ta
cherry blossom tree NOM park-in itself-by plant-PAST
“A cherry blossom tree planted (*int*) in the park by itself”

(209) a.* The wallet was found by itself.

b.* Saihu ga hitoride-ni mitukat-ta
* wallet NOM itself-by find-PAST
“The wallet found (*int*) by itself.”

Contrary to the examples (204), (205), and (206), all of these examples in English and Japanese cannot take “by itself (*hitoride-ni*)”, which means the eventuality in all the sentences is always brought about by the implicit external cause. The difference of behaviour with the phrase “by itself” between Pattern 1 and Pattern 2 reveals that the assumption of Levin and Rappaport Hovav is wrong—Pattern 2 verbs such as “break”, “sink”, “open” always imply an external cause. Also, these results seem to give some validity to Kageyama’s distinction between Pattern 1 and Pattern 2 verbs, and to support

his explanation of the difference between their means of derivation. That is, Pattern 1 verbs can be explained by identifying the cause (agent) with the theme, Pattern 2 verbs by binding the external cause (agent).

However, it appears that Kageyama's idea is still problematic due to his focus on affixes. As mentioned before, there is significant variation in the verb endings, and there is no regularity in the Japanese suffix system which is directly compatible with syntactic behaviour. Therefore, Kageyama's categorisation of Pattern 1 and Pattern 2 verbs by suffix may be plausible in the sense of showing a general tendency, but it must be also admitted that there are some exceptions which contradict Kageyama's claim. For example, he makes a prediction—in Japanese, the infix “ar” is presumed to have the function of binding the external cause, and making the intransitive use possible, but in fact, a verb such as *simeru/ simaru* (close) is categorised as Pattern 2 based on its suffix, it can appear with the phrase “*hitoride-ni*”(by itself) unlike other verbs in Pattern 2 contrary to Kageyama's prediction. In contrast, a verb like *kataduku/katadukeru* (be cleaned/clean) belongs to Pattern 1 according to its suffix, which is a group with a transitive counterpart; however, it does not take the phrase *hitoride-ni* (by itself), which also contradicts Kageyama's account.

As already seen above, Levin and Rapport Hovav's and Kageyama's view on detransitivisation differ in interpreting the derivation in lexical semantics, but they share the same idea of the linking system, which is based on UTAH.

(210) Uniformity of Theta Assignment Hypothesis (UTAH)

Identical thematic relationships between items are represented by identical structural relationships between those items at the level of D-structure.

(Baker1988:46)

However, there are some groups of verbs, which do not fall under UTAH. Psychological (psych) verbs are the examples, the linking of these verbs differs from what UTAH suggests. Let us look at some reviews of psych verbs in the next section.

4.3 Psych verbs in English and Japanese

4.3.1 Psych verbs in English

Psych verbs like *fear* and *frighten* have presented a fundamental problem concerned

with the linking of thematic roles and syntactic positions. Before the birth of generative grammar, they were simply treated as transitive verbs with object and subject. However, as GB theory developed, psych verbs started attracting much attention as an interesting phenomenon exhibiting irregular mapping. A number of linguists have attempted to give a uniform account for this irregular mapping. It is assumed that there are two classes of psych verbs subject-experiencer (SE) verbs (ex. *fear*, *enjoy*, *dislike*, etc.) and object-experiencer (OE) verbs (ex. *frighten*, *amuse*, *distress*, etc.). Example of each class of verbs are:

- (211) (SE) a. Tom fears ghosts.
 b. John enjoys classical music.
- (212) (OE) a. Ghosts frighten Tom.
 b. Classical music amuses John.

The linking problem is exhibited by the fact that OE verbs have Theme in the subject position and Experiencer in the object position. This violates the assumption that the relation between thematically specified arguments and syntactic position is uniform, because it contradicts the thematic hierarchy. The choice of a subject in GB is generally made in accordance with a thematic hierarchy, the highest argument on the hierarchy being chosen as a subject. Recall the UTAH formulated by Baker, which claims that there is a systematic relation between thematic information and syntactic projections as in (210).

The UTAH assumes that an argument which bears a particular thematic role is consistently mapped into the same syntactic position at D-structure. For example, an Agent is always projected as subject. If this principle is valid for all the cases, things are straightforward. However, some group of verbs exhibit an irregular mapping, which contradicts UTAH. Look at these examples:

- (213) a. Ken fears ghosts.
 Experiencer Theme
- b. Ghosts frighten Ken.
 Theme Experiencer

(213a) and (213b) share the same thematic roles (Experiencer, Theme), but differ in

their syntactic representation. Thus, an alternative solution is necessary, one of which is the Thematic Hierarchy which was originally presented by Jackendoff (1972) and have been restated by a few scholars (Grimshaw 1990; Bresnan and Kanerva 1989; Pesetsky 1995). These new versions of the Thematic Hierarchy share a basic concept, but differ in some respects such as the labels of Themes and the types of Themes which are included. Grimshaw's (1990) version of Thematic Hierarchy is more similar to Jackendoff's (1972) except for the fact that Jackendoff does not include the Experiencer, which is one of the main thematic roles in our discussion. Thus let us look at Grimshaw's version, here.

(214) (Agent (Experiencer (Goal / Source / Location (Theme))))

(Grimshaw 1990:8)

The Thematic Hierarchy does not specify a one to one relation between a particular argument and a particular position unlike UTAH, but it assumes a relative mapping system along the Thematic Hierarchy. That is, if the argument is placed higher in the thematic hierarchy, it will be realized higher in the syntactic position.

However, in (212a) and (212b), the Theme is ranked higher than the Experiencer, which contradicts the Thematic Hierarchy as shown in (214). Several solutions to this problem have been presented and we shall briefly look at the approaches of Belletti and Rizzi (1988), Grimshaw (1990), Jackendoff (1990) and Pesetsky (1995).

4.3.1.1 Belletti and Rizzi (1988)

In Belletti and Rizzi's (1988) theory, psych-verbs are assumed to be unaccusative verbs, which lack an external argument and fail to assign case to D-structure objects. Belletti and Rizzi identify three classes of psych verbs in Italian.

(215) Class I: *temere* (fear)

Gianni teme questo.

"Gianni fears this"

(216) Class II: *preoccupare* (worry)

Questo preoccupa Gianni.

"This worries Gianni"

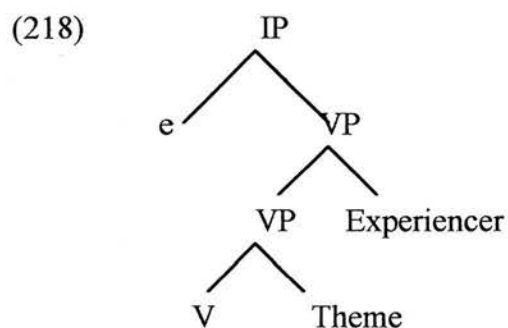
(217) Class III: *piacere* (like)

A Gianni piace questo.

“To Gianni pleases this”

(Montrul 1998:29)

According to Belletti and Rizzi's (1988) analysis, Class I of psych verbs are equivalent to transitive structures in English, where the Experiencer is projected onto the D-structure subject position, and the Theme is projected onto the object position. They assumed Class II and Class III to be unaccusatives, though they appear to be different from their argument structures. In Class II, the Theme is the subject and the Experiencer is projected onto the object position, and in Class III, the Theme is in the object position, but the Experiencer is assigned the case of an indirect object (dative).



As shown in (218), it is assumed that the Experiencer occupies a higher, c-commanding position than the Theme. The Experiencer is assigned case, and does not move, while the Theme moves to the subject position, which is empty.

In sum, the Theme originates as an internal argument and moves to the subject position.

4.3.1.2 Grimshaw (1990)

Grimshaw's (1990) analysis has something common with Belletti and Rizzi's (1988) in that some psych verbs are similar to unaccusative verbs, which will be referred to later. However, the main difference between Grimshaw's (1990) view and Belletti and Rizzi's (1988) is her assumption that the Theme originates in the subject position, while Belletti and Rizzi (1988) claim that a Theme appears in the subject position only as a result of movement.

To summarise Grimshaw's analysis briefly here, she posits a version of the thematic hierarchy, which is similar to Jackendoff's original assuming that an argument structure of a predicate is made up based on the Thematic Hierarchy as shown in (214).

Grimshaw suggests that the argument which bears a thematic role higher in the Thematic Hierarchy is also the most "prominent" argument aspectually. For example, the verb "fear", have the Experiencer realized as subject, and the Theme realised as an object. This is illustrated as follows:

- (219) a. fear (x (y))
 Experiencer Theme
 b. Tom fears snakes.

The mapping of "fear" complies with the principle. However, some verbs such as "frighten", "disturb" share the same thematic roles as "fear", but their syntactic representations are different as follows:

- (220) a. frighten (x (y))
 Experiencer Theme
 b. Snakes frighten Tom.

(220a) contradicts the principle, because the Experiencer which is placed higher in the thematic hierarchy is not realized as subject. Thus, Grimshaw proposes the aspectual analysis as a solution. She claims that the event can be broken down into subparts which are labeled 1 if it occurs in the first sub-event, and 2 if it occurs in the second sub-event. The argument which has a label 1 is regarded as the most prominent. Grimshaw explains that a cause argument is always combined with the first sub-event, and more prominent than other argument which are associated with the second sub-event. She provides a representation for each type of verb associating the thematic dimension and the aspectual dimension as follows:

- (221) a. Transitive agentive
 (Agent (Theme))
 1 2

b. Ditransitive

(Agent (Goal (Theme)))

1 x x

c. Unergative

(Agent)

1

d. Psychological state

(Exp (Theme))

1 2

e. Psychological causative

(Exp (Theme))

2 1

f. Agentive psychological causative

(Agentive (Exp))

1 2

g. Unaccusative

((Theme))

2

(Grimshaw 1990:28)

As mentioned above, Grimshaw considers psych verbs to be quite similar to unaccusatives, because neither of them has the "maximally dominant" argument thematically as shown in (221d) and (221g), this makes both types of verb lack an external argument, since an external argument requires the most dominant argument both in the thematic and the aspectual dimension. The main difference of Grimshaw (1990) from Belletti and Rizzi (1988) is that the former thinks that there is also a difference between psych verbs and unaccusative verbs—Psych verbs have the most dominant argument in the aspectual dimension, while unaccusative verbs do not have the most dominant argument in either dimension.

4.3.1.3 Jackendoff (1990)

In contrast to Grimshaw (1990), Jackendoff (1990) claims that psych verbs have external arguments, which stems from the fact that he gives a different definition of external argument. We shall go back to this point later.

First, to give a brief review of Jackendoff's approach to psych verbs, Jackendoff (1990)

also supports the idea that the thematic hierarchy is responsible for the choice of subject, however, the thematic hierarchy which he assumes consists of not only the θ -roles in the thematic tier such as Agent, Theme, Goal, etc., but also the ones in the action tier such as Actor or Patient. The θ -roles in the action tier are ranked higher on the thematic hierarchy than those in the thematic tier, which means that the choice of a subject is dependent on the θ -roles in the action tier.

Psych verb predicates have the θ -roles, Theme and Experiencer in the thematic tier, which correspond to Actor and Patient in the action tier. Therefore, the Theme/ Actor argument, which is ranked highest, is selected as a subject.

Here, let us finally go back to the issue raised at the beginning, Jackendoff (1990) defines external arguments as those, which bear the highest θ -role on the thematic hierarchy (Jackendoff 1990:269), and psych verbs predicates take an argument with the Actor θ -role, which is the highest on the thematic hierarchy. This is the reason why he claims that psych verbs have external arguments.

4.3.1.4 Pesetsky (1995)

It has been generally assumed that there are two types of psychological verbs –one whose Experiencer appears in subject position as in (222a), namely, “Subject Experiencer (SE) verbs”, and another whose Experiencer appears in object position as in (222b), namely, “Object Experiencer (OE) verbs”(see 4.3.1 for details).

- (222) a. Ben fears ghosts.
b. Ghosts frighten Ben.

Pesetsky (1995) reconsidered the θ -role. Theme, with respect of SE and OE predicates, and claims that the θ -role associated with the subject of the OE class and the one associated with the object of the SE class should not be treated as the same Theme θ -role. He decomposes Theme into two entirely different roles, which are *Causer* in OE verbs, *Target of Emotion* and *Subject Matter of Emotion* in SE verbs. The thematic hierarchy which Pesetsky postulate is as follows:

- (223) Causer > Experiencer > Target / Subject Matter (T/SM)
(Pesetsky 1995:59)

The θ -grid for OE verbs is [Causer, Experiencer], and that for SE verbs is [Experiencer, Target/ Subject Matter], which does not violate Baker's Uniformity of Theta Assignment Hypothesis (UTAH) (1988:46) as follows:

(224) Uniformity of Theta Assignment Hypothesis (UTAH):

Identical thematic relationship between items are represented by identical structural relationship between those items at the level of D-structure.

Pesetsky (1995) assumes that OE verbs in English are bimorphemic as in some other languages such as Japanese, but the difference between English and Japanese is that OE verbs in English have a phonologically null causative morpheme, named CAUS by Pesetsky, while those in Japanese do not as the following example shows

- (225) a. Sono sirase-ga Tanaka-o Kanasim-sase - ta.
 that news-NOM Tanaka-ACC be sad-CAUSE-past
 "That news saddened Tanaka"
 b. The news [CAUS [depressed_v]_v] Bill.

(Pesetsky 1995:7)

Pesetsky (1995) explains that OE verbs such as *annoy* are composed of a root $\sqrt{\text{annoy}}$ which is actually an SE predicate, and a zero CAUS as shown in (226).

- (226) OE: *annoy* \longleftarrow [[$\sqrt{\text{annoy}}$] ϕ CAUSE]

The concept of zero CAUS is crucial for the T/SM restriction; the two distinct θ -roles, Causer and T/SM cannot occur together in the same predicate if it contains a zero CAUS, but they can occur together if it is a periphrastic causative *make* construction as shown in (227).

- (227) a. The newspaper article annoyed me.
 b. * The newspaper article annoyed me at the government.
 c. The newspaper article made me annoyed at the government.

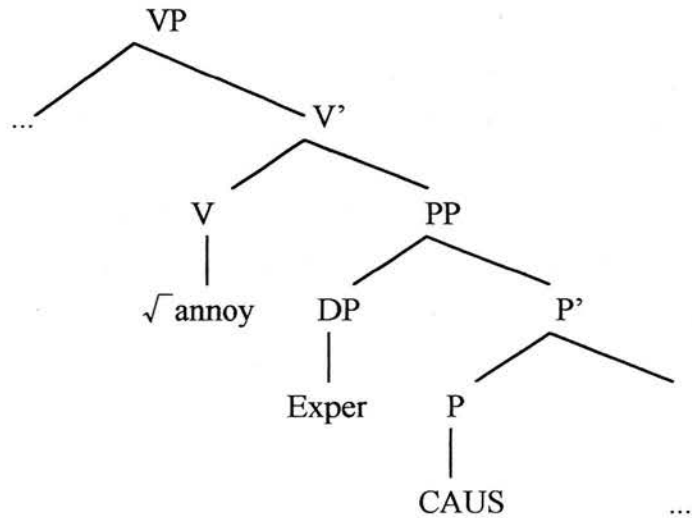
(White et al. 1997:696)

Thus, the imposition of T/SM restriction is totally dependent on whether it contains a

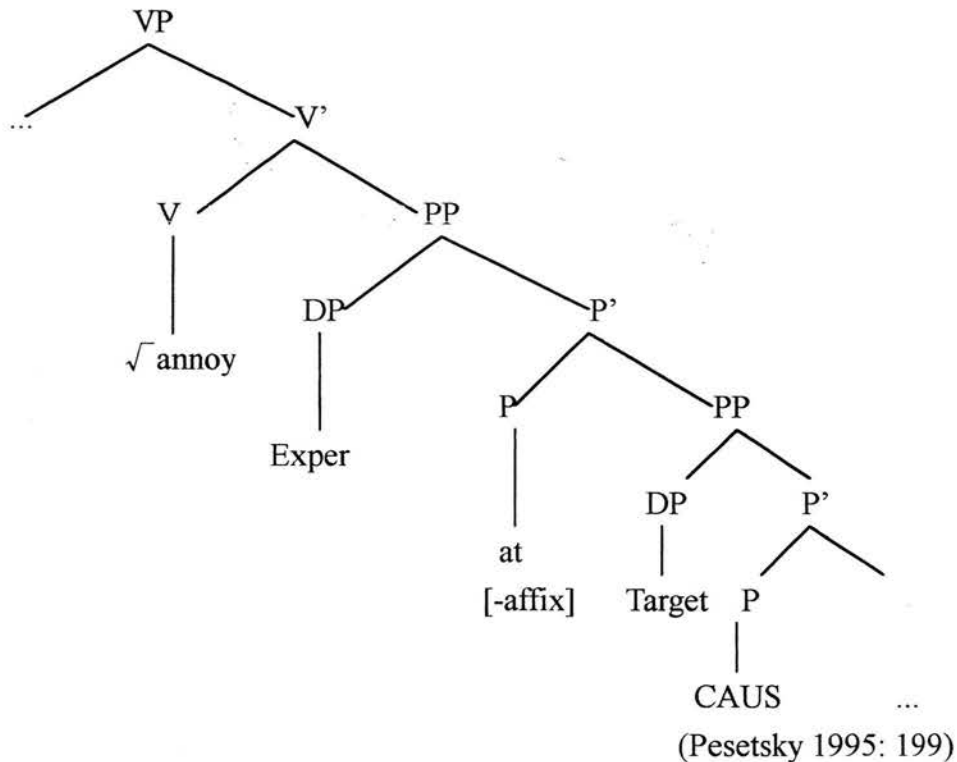
zero CAUS or not, which can be explained in the syntax, rather than in the semantics.

First, he gives two different tree diagrams to illustrate his accounts; one is the diagram of an OE predicate without T/SM; the other with T/SM.

(228) a.



b.



As in (228), Pesetsky assumes that CAUS and Causer are situated lower in the PP than

Experiencer. CAUS originates in the independent position of main verb, but it has a strong feature to be discharged, and must raise to V to adjoin to the head (e.g. $\sqrt{\text{annoy}}$). In (228a), there is no problem for CAUS to raise to $\sqrt{\text{annoy}}$, because there is nothing to intervene between them. By contrast, in (228b), the phrase head *at* intervenes between CAUS and $\sqrt{\text{annoy}}$ so that CAUS cannot move to V without adjoining first to *at*.

With respect to periphrastic constructions, Pesetsky argues that verbs such as *make* which are already semantically causative do not contain a CAUS affix. Therefore, there is no movement intervened by T/SM. Thus, Causer and T/SM can occur together.

4.3.2 Psychological verbs in Japanese

Unlike English, which does not have any overt causative morpheme in either the SE and OE class, in Japanese the difference between the OE and SE class is encoded morphologically, and is thus directly observable. According to Katada (1996), some scholars assume that the equivalent OE verbs in Japanese are formed by adding the causative morpheme, *-(s)ase* as follows: (Fujita 1993; Grimshaw 1990; Kuroda 1965; and others).

(229) *yorokobu*

- a. Taro-ga sono kekka – o yorokon - da.
 Taro-NOM that result-ACC be pleased-PAST
 “Taro was pleased at that result”
- b. Sono kekka- ga Taro- o yorokob – ase - ta
 that result- NOM Taro-ACC be pleased-CAUSE-PAST
 “That result pleased Taro”

However, Katada (1996) has a slightly different view on this, which is that *V-(s)ase* construction should not be regarded as the equivalent of OE verbs in English, but rather as the equivalent of periphrastic *make*. If Katada’s claim is employed here, a more accurate translation of (229b) in English would be “*that result made Taro pleased*” rather than “*that result pleased Taro*”. This idea is parallel to Pesetsky’s (1995), claiming that “the examples in (131) [(230a)] are already more like the English

periphrastic examples in (124) [(230b)] rather than the single verb examples in (120)–(122) [(230c)]” (Pesetsky 1995:46).

- (230) a. [Zibun_i-ga gan kamo sirenai koto]- ga Hiroshi_i-o nayam-ase-ta
 refl- NOM cancer may have fact –NOM Hiroshi-ACC worry-CAUSE-past
 “The fact that himself_i may have cancer worried Hiroshi_i”

b. Each other’s remarks made John and Mary angry.

c. Each other_i’s remarks annoyed John and Mary.

(extracted from Pesetsky 1995:43–45)

As the evidence for her argument, Katada (1996) points out that the *V-(s)ase* construction can take the Target and Subject Matter without violating the T/SM restriction. Given that the T/SM restriction is valid, *V-(s)ase* is not regarded as the equivalents of OE verbs in English, because it cannot take Target and Subject Matter, as follows:

- (231) a. The newspaper article annoyed me.
 b. * The newspaper article annoyed me at the government.
 c. The newspaper article made me annoyed at the government.

(White et al. 1997:696)

- (232) a. sono sinbunkiji – ga watasi-o iratuk-(s)ase-ta
 the newspaper article NOM me -ACC annoy-CAUSE-PAST
 b. -----
 c. sono sinbunkiji -ga watasi-o seihu-ni iratuk-(s)ase-ta
 the newspaper article-NOM me-ACC government-DAT annoy-CAUSE-PAST

Following Katada and Pesetsky’s claim, OE verbs in Japanese are very rare; therefore an SE verb + *(s)ase* construction is used very often to make up for the lack of OE verbs in Japanese. There are also several SE verbs in Japanese, some of which are not found in English, which can be represented only in passive constructions. Table 4-13 shows the list of SE, OE verbs and periphrastic construction in English and Japanese.

Table 4-13: The classification of psychological verbs in English and Japanese

SE verbs [Experiencer, Theme]		OE verbs [Causer, Experiencer]		Periphrastic <i>make/(s)ase</i> construction	
English	Japanese	English	Japanese	English	Japanese
fear	obieru	anger	—	make-angered	okr-(s)ase
hate	kirau	annoy	—	make-annoyed	nayam-(s)ase
like	konomu	disappoint	—	make-disappointed	otikom-(s)ase
admire	sitau	frighten	—	make-frightened	obiya-(s)ase
miss	natukasimu	please	—	make-pleased	yorokob-(s)ase
enjoy	tanosimu	surprise	—	make-surprised	odorok-(s)ase
love	aisuru	hurt	—	make-hurt	kizutuk-(s)ase
scorn	mikudasu	amuse	—	make-amused	tanosim-(s)ase
(become angered)	okoru	bore	—	make-bored	aki-(s)ase
(become annoyed)	nayamu	irritate	—	make-irritated	iratuk-(s)ase
(become disappointed)	otikomu	gloom	—	make-gloomed	nagek-(s)ase
(become frightened)	obieru	disgust	—	make-disgusted	mukatuk-(s)ase
(become pleased)	yorokobu				
(become hurt)	kizutuku				
(become amused)	tanosimu				
(become bored)	akiru				
(become irritated)	iratuku				
(become depressed)	nageku				
(become disgusted)	mukatuku				

As Table 4-13 shows, only a subset of SE verbs in Japanese correspond to those in English, and the rest are OE verbs in English. It can be predicted that this difference may cause a learnability problem for Japanese learners, which shall be discussed in the next section.

4.4 Summary

In this Chapter, transitive and intransitive verbs in English and their Japanese equivalents are compared in terms of the similarities and differences in the properties of verbs. In the first section, monadic verbs are examined, and these are shown not to exhibit the transitive/intransitive alternation. The equivalent Japanese verbs to those in English in the Split Intransitivity Hierarchy are selected, and explored with respect to the verbs' behaviour against three types of diagnostic test: Quantifier floating, Resultative construction, and *te-iru* construction (These tests are explained in 3.1, 3,

and 3.3 respectively). In sum, the analysis reveals more variation in the three diagnostic tests with peripheral verbs, but less variation with the core verbs, and this parallels Sorace's data from Western European languages.

In the second part, two types of dyadic verb are discussed, based on Levin and Rappaport Hovav (1995) and Kageyama (1996): one type which allows the transitive/intransitive alternation and another type which does not. There is a difference in the interpretation of "detransitivisation" between these authors, and Kageyama's account better explains the fact that the verb types exemplified by: *ueru/uwaru* (plant/planted), *kimeru/kimaru* (decide/be decided), *mitukeru/mitukaru* (find/be found), have English equivalents for the transitive form, but not for the intransitive.

Finally, psych verbs in English and Japanese were examined. These verbs are all dyadic, but some groups of psych verbs exhibit an irregular argument mapping which contradicts the UTAH hypothesis that a certain argument should consistently be projected in the same syntactic position. Several attempted explanations, including those of Belletti and Rizzi (1988), Grimshaw (1990), Jackendoff (1990) and Pesetsky (1995) are reviewed, and then psych verbs in Japanese are analysed. It is observed that most of the Japanese psych verbs are categorized as Subject-Experiencer psych verbs (SE verbs), differing from English which has more Object-Experiencer psych verbs (OE verbs) than SE verbs.

CHAPTER 5

SECOND LANGUAGE ACQUISITION: KEY ISSUES

5.0 Introduction

As the importance of the lexicon in L2 acquisition has been recognised in terms of the syntax-semantics correspondence, verb semantics and morphosyntax in L2 acquisition have been attracting more attention among scholars, and many empirical studies have been conducted on different grammatical phenomena such for example as the dative alternation, locative verbs, the unaccusative/unergative distinction, the causative/inchoative alternation and psychological verbs (see Introduction for details).

This chapter will focus on L2 studies of split intransitivity and the transitive alternation. Initially, this topic was researched almost exclusively in English (Zobl 1989; Yip 1995; Balcom 1997; Oshita 1997; Juffs 1996), and with the sole exception of Italian (Sorace 1993a, 1993b, 1995a, 1995b). However, studies of other languages have recently started to appear: Spanish and Turkish (Montrul 1997, 1999), Chinese (Yuan 1999), Japanese (Hirakawa 1999, 2000, 2001). In general, these studies employ elicited production or grammaticality judgment tests, while Zobl (1989) and Oshita (1997) observed L2 production data focusing on the types of error which involve split intransitivity and the transitivity alternation. This chapter will review these studies in chronological order, but prior to the reviews, the issues which are relevant to the current study will be discussed first, including L1 influence (transfer) and UG and The role of positive evidence. We shall start with the discussion of L1 influence (transfer) and UG.

5.1 The issues on L2 acquisition

5.1.1 L1 influence (transfer) and UG

Dulay and Burt (1973) reported the role of L1 transfer as negligible. In their morpheme-order studies, they presented data to show that transfer was nonexistent in L2 learning. However, starting in late 1970's, several scholars conducted research to reanalyse the data presented by Dulay and Burt, and presented new evidence to show the influence of L1 in interlanguage (Arabski 1979; Anderson 1978, 1983; Kellerman 1983, 1984). The point which is common to them all is that the influence of L1 (transfer) is evident in interlanguage, and plays a significant role in its acquisition. In

addition, with the development of the parameter-setting model within GB theory, the role of L1 has been reconfigured in terms of parametric values, and has come to be referred to as “L1 influence” rather than “transfer” in recent theoretical debate. White (1992) gives the following four points as the main differences between the concept of transfer (L1 influence) in UG and earlier approaches.

- (233) (i) **levels** – generative grammar crucially assumes that representations involve a number of different syntactic levels; transfer may affect some or all of these, with direct or indirect consequences. The CAH, in contrast, constrained on “visible” surface similarities and differences between languages.
- (ii) **clustering** – parameters link clusters of properties, which superficially might seem to be unconnected. Thus the claim that the L1 value of a parameter will be adopted, or will colour the L2 learner’s perception of the L2 input, is a claim about a whole range of structures in the interlanguage.
- (iii) **interacting parameters** – since UG contains many parameters, it is likely that a number of these will have to be reset in L2 acquisition. This leads to the possibility that they will not all be reset at the same time. In that case, interlanguages will result that are neither exactly like the L1 nor the L2. Similar effects will be achieved if learners adopt parameter settings which are present in neither the L1 nor the L2.
- (iv) **learnability** – certain parameter settings may be unmarked or marked, their status determined by learnability considerations, in particular by the assumption that L1 acquisition proceeds largely on the basis of positive evidence. When applied to L2 acquisition, this perspective gives a different twist to transfer issues from traditional claims about markedness and transfer.

(White 1992: 220-221, My boldtype)

Regarding the second point, clustering, recent research by Neeleman and Weerman (1997) presents some implications of the view of parameters in L2 and L1 acquisition. They focus on the OV/VO parameter which relates to the domains of basic word order, scrambling, Exceptional Case Marking, and the distribution of particles. Their claim is parallel to Clahsen and Muysken (1986,1989)—parameters are not accessible in L2 acquisition, instead, the positing of construction-specific rules which are guided by general learning strategies are involved in L2 acquisition, whereas parameters are accessible in L1 acquisition, which means parameter setting is completed at a very early stage.

The relation of L1 influence and UG, or the L1 influence itself in the acquisition of argument structure patterns in L2 has been mainly investigated through the phenomena of the dative alternation (Mazurkewich 1984a,1984b; Hawkins 1987; White 1987,

1991a), locative verbs (Juffs 1996), unaccusative/unergative verbs (Zobl 1989; Sorace 1993a, 1993b, 1995a, 1995b; Yip 1994; Juffs 1996), the causative/inchoative alternation (Adjemian 1983; Montrul 1997), and in recent years, psych verbs (Juffs 1996; White et al. 1997; Montrul 1998). Among these studies, Montrul (1997, 1998) has reported consistent results from her experimental data. We shall briefly review those two studies.

Montrul (1997) investigated the acquisition of the causative/inchoative alternation in Turkish as a second language by adult English and Spanish learners. Montrul predicted that L1 influence would play a role with the morphological marking of alternating verbs because of its difference among these three languages. However, she assumed that this would be just developmental, and due to the ignorance of the specific semantic constructions in L2. Montrul carried out some proficiency tests and a picture judgement task with a scale (ranged from -3 to 3). The results reveal a distinctive difference in the performance of judgement between the Spanish and English group – the English group found more difficulty in rejecting the sentences without the required anticausative morphology, and tended to wrongly accept them. Montrul reasoned by analogy that this would stem from the fact that English is not morphologically rich unlike Turkish or Spanish. Synthesizing all the results, she concludes that although some universal principle is assumed to be involved with the errors with transitivity, the role which L1 influence plays should be stronger in the acquisition of derivational morphology (causative and anticausative) which is characteristic in alternating verbs of Turkish.

Montrul's (1998) study on the acquisition of dative experiencer subjects shows results which are parallel to this. Dative experiencer in Spanish is a phenomenon seen in a subset of psych verbs and unaccusative predicates. According to her account, it used to exist in Old English, but it does not exist in Modern English because of the loss of dative case; in French, dative experiencers are possible apart from some syntactic differences from Spanish, which is that dative experiencers occur postverbally, and never cooccur with a clitic. However, these differences are just at S-Structure, and the constructions with dative experiencers are basically the same at the D-Structure level among these three languages (French, Spanish, English). Montrul tries to find out what kind of role L1 influence and UG play in the acquisition and mental representation of these predicates. She hypothesised that if UG is still available and learners can access it, they should recognise the prominence differences in the thematic hierarchy

among arguments in L2. She also claims that L1 influence can be proved by looking at how they treated dative experiencer with case assignment and checking. If L1 plays an important role, there must be great differences in the results of the task between the two language groups. She gave two different tasks in her experiments: interpretation task and preference task. The data from the experiment produced results which are similar to Montrul (1997) – L1 influence plays an important role with the surface properties of language involved in case assignment and checking, while UG plays a role with deep properties of language like the thematic hierarchy. However, she points out that it would be just at the starting point that L1 influence plays a role. Her claim is that L1 influence will be gradually overcome by building new representations which are not based on L1, and learners are eventually able to take L2 input to reconstruct them. This idea is compatible with Full transfer/ Full access (Schwartz and Sprouse 1996).

Both studies (Montrul 1997; 1998) share the similar conclusion that UG plays a central role with deep properties such as the thematic hierarchy; while L1 influence is involved with the surface properties such as morphology or case assignment. As Montrul implies in her second study, the role of L1 influence would differ between the initial stage and the late stage of IL grammar. Further research on the role of L1 and UG needs to be done with having two distinct groups which respectively consist of beginners and advanced learners. The issue of L1 influence is closely related with “markedness”, which follows next.

5.1.2 The role of positive evidence

Bley-Vroman (1986) explains that there are two types of learner-hypothesis: Type-N hypothesis and Type-P hypothesis. The former requires “negative” evidence for testing, which is information about ungrammaticality, while the latter can be confirmed on the basis of “positive” evidence itself such as comprehensible input. Since the beginning of the 1990s, researchers have started to investigate the roles of negative and positive evidence (White 1991b, 1991c; Carroll and Swain 1993; Trahey and White 1993; Trahey 1996), and the role of the formal instruction with negative feedback (Tomasello and Herron 1988, 1989; Fotos and Ellis 1991; Ellis 1992; Fotos 1993; Yip 1994; Izumi 1998). Since our study deals with the grammatical phenomena which are supposed to be acquired through natural input, and since our concern is whether the length of exposure to the language will make a difference in the acquisition of the target grammatical phenomenon, only the role of positive evidence relevant to the current

factor.

Trahey (1996) has presented data on the long term effect of positive evidence with the same subjects as those in the original study (Trahey and White 1993). One year after the 2-week exposure on adverb placement in English, she gave the follow up test on the English adverb to the same subjects as used in the previous research.

The results reveal that the learners retain their knowledge of the grammatical SAV order, but they also kept and used the ungrammatical SVAO order at the same time. These results bring about two important findings. Firstly, the input flood with positive evidence will have a long-term effect. Secondly, the lack of preemption in L2 acquisition will not be a temporary phenomenon, which will last until some trigger to remove an old setting is available. That is, the length of time is assumed not to be the factor which is concerned with the emergence of preemption.

Trahey concludes that “it (PLD:Primary Linguistic Data) alone is not sufficient to bring about this change in knowledge, and something else – in addition to primary linguistic data – would be required” (Trahey 1996:135) : sufficient amount of input flood or negative evidence or both positive and negative evidence. What we can see from the results of Trahey and White (1993) and Trahey (1996) is that inputs with only positive evidence bring about optionality observed in the L2 learner's data, and this is not pre-empted after a certain length of time. Since the Quantifier Floating (QF) construction which our study deals with allows optionality with unaccusatives but not with unergatives, the implications of these phenomena deserve experimental examination as well.

We have reviewed three main issues which are relevant to our study. Let us now move on to the reviews of L2 studies on split intransitivity and transitive alternation.

5.2 L2 acquisition of split intransitivity and transitivity

5.2.1 Zobl (1989)

Zobl (1989) is the first to address the issue of the irregular pattern in split intransitive sentences produced by L2 learners. He predicts that there are three types of nonstandard structure, which may arise from the mapping problem posed by split intransitivity, as seen in the following examples (235).

(235) a. **the postverbal subject** [e[V NP]

ex. I was just patient until dried my clothes. (Japanese L1; high intermediate)

b. **the preverbal subject in the pseudotransitives** [dummy NP [V NP]]

ex. I think it continue of today condition forever. (Japanese L1; intermediate)

c. **the “passive” unaccusatives**

ex. Most of people are fallen in love and marry with somebody

(Japanese L1; high intermediate)

Zobl suggested that these three nontarget forms could be explained by assuming the Unaccusative Hypothesis. He first points out that the postverbal subjects are found in the influence of L2 learners who lack knowledge that the subject position needs to be phonologically realized in English. Secondly, the preverbal subject form is produced if learners have acquired the knowledge that the subject position must be filled. Thirdly, the “passive” unaccusative form is produced by learners who wrongly treat passive and unaccusative verbs in the same way, because both have a logical object and lack a logical subject. They use the passive auxiliary “be” so as to mark the lack of a logical subject.

Zobl investigated the frequency of the three nontarget forms in production data from compositions written by 114 L2 learners in ESL programs in North America. The breakdown of their nationality is: Japanese (90), Arabic (10), Spanish (10), Chinese (1), Turkish (1), Thai (1), and Indonesian (1). Three verb *categories* were investigated; transitive, active intransitive, and unaccusative.

According to the list of occurrences of be, there were 25 cases of ungrammatical use of passive with 15 unaccusative verbs out of a total of 110 unaccusative verbs. In contrast, there were only 11 cases with unergatives and transitives out of a total of 173 potential contexts.

Zobl suggests that the ungrammatical use of the passive is more likely to appear with unaccusatives. Furthermore, the same types of unaccusative such as ‘happen’ appear several times, while unergative and transitive verbs do not appear with ‘be’ more than once. With respect to (Pro)VS, there were 10 cases of (Pro)VS produced by the Japanese speakers. Zobl points out that this cannot be attributed to L1 transfer, because Japanese is a verb-final language.

The findings indicate that L2 learners unconsciously know the unaccusative/unergative distinction, which confirms the Unaccusative Hypothesis. Zobl assumes that *be+en* incorrect passive unaccusatives stem from the grammatical function of *be+en* as an overt marker of syntactic movement. He denies the causativisation account because of the scarcity of examples.

5.2.2 Yip (1995)

Yip (1995) observes that “passive” unaccusative errors are seen even in advanced Chinese-speaking learners of English. She gives some examples found in compositions written by the learners as follows:

- (236) a. * I do not think that such abusive action *should be happened* to a twelve year old child.
 b. * Rush hour traffic *can be vanished* because working at home is a new version.
 c. *This kind of diagnostic situation *can only be appeared* in society where the two different variation should not be too difficult and too similar.

(Yip 1995:130)

In these examples, if the Chinese learners simply transferred the structural pattern of Chinese to the English sentences, the errors in (236) would not have been made, since Chinese does not allow monadic unaccusatives to be passivised like in English, shown in (237) and (238).

- (237) * Shenme bei fasheng – le?
 what PASS happen –PFV
 “* What was happened?”

- (238) * Shuye bei diao-le xia lai.
 leaf PASS fall-PFV down come
 “* The leaves were fallen down”

(Yip 1995:136)

However, Chinese and English are different in that NP movement is optional in Chinese. That is, the underlying object NP can either move to subject position to receive the nominative case or remain in object position, as seen in (239) and (240).

(239) Zuotian fasheng-le ji jian shiqing.
 yesterday happen-PFV several CL thing
 "Several things happened yesterday."

(240) Diao-le hen duo shuye xia lai
 fall-PFV very many leaf down come
 "A lot of leaves have fallen down."

(Yip 1995:136)

Yip conducted an experimental study to investigate whether Chinese learners acquire the unaccusative/unergative distinction in English. The participants were 10 intermediate and 10 advanced Chinese speaking learners of English. A grammaticality judgment task was employed to test the following 6 types of sentence.

1. Grammatical passives, e.g. *All these books should be returned in two weeks,*
2. Grammatical ergatives, e.g. *The mirror shattered during the last earthquake.*
3. Ungrammatical passivized ergatives, e.g. *What was happened here?*
4. Ungrammatical pseudo-passives, e.g. **My courses can classify into two types.*
5. Grammatical auxiliaries, e.g. **I have been working very hard.*
6. Ungrammatical auxiliaries, e.g. **They should have punished.*

(Yip 1995:140)

With respect to the unaccusative construction, the results show that learners wrongly reject grammatical unaccusatives as Type 2. The mean score of correct responses is 25% for the intermediate learners, 37.5% for advanced learners, which does not statistically show any significant difference between the two groups. In contrast, learners do not have any problem with accepting the grammatical passives, and show a high mean score of correct responses (78% for intermediate; 96% for advanced).

The learners in both groups tend to reject the correct unaccusatives and extend the passive rule to unaccusatives. Yip assumes that the extended use of passive morphology stems from the learners' wrong assumption that unaccusatives are derived from transitives, which is contrary to Zobl's (1989) claim. According to this analysis, learners wrongly add a causer of the event to the argument structure of nonalternating unaccusative verbs and extend causativization to nonalternating unaccusative verbs as well, as in the following example:

- (241) a. The accident happened.
 b. John happened the accident.

Yip's account is also parallel to Montrul's (1997, 1999, 2000) in assuming that passive unaccusatives originate in the extension of causativisation to nonalternating unaccusatives. However, Oshita (2000) does not think this is plausible, because if it is the case, more evidence of passive unaccusatives with a *by* phrase like "*The car accident was occurred by Tom*", should be reported. However, there is little evidence of such errors.

5.2.3 Balcom(1997)

Balcom (1997) investigated the acquisition of syntax of unaccusativity in English by Chinese speaking learners. She addresses the issue of inappropriate passive morphology in the English writing of L2 learners, which was firstly discussed in Zobl (1989), and conducted experiments with a grammaticality judgment task and a cloze test. The participants of her experiment were 38 university students whose L1 was Chinese, and 56 native speakers in English as a control group. The grammaticality judgment task consisted of 20 grammatical sentences and 15 ungrammatical sentences which contained the inappropriate passive morphology 'be'+ *en*. Some examples of the test sentences are as follows:

- (242) a. Experiential verbs with a [-human] Theme subject:
 The riot occurred after the police officers had been acquitted.
 b. Unaccusative verbs with transitive counterparts (Theme subject):
 *The door was closed smoothly because Mary had remembered to oil the hinges.
 c. Stative unaccusative verbs (Theme subject):
 *This soup was tasted good after the cook had added some salt.

(extracted from Balcom 1997: 3)

The results of the grammaticality judgment test confirm Zobl's account, and show that the learners accepted 'be'+*en* much more with alternating unaccusatives, and middle constructions and so on, whose subject is a Theme and denote state or change of state. Significant differences in response between learners and controls were only seen with unaccusative verbs. The results of the cloze test show some variation in the

occurrence of 'be'+*en* across the verb classes of unaccusatives. Balcom notes that in the cloze test 'be'+*en* did not appear as frequently as in the grammaticality judgment test. She suggests that the lack of ungrammatical stimuli in the cloze test may bring about these results. However, the results do reveal that the frequency of 'be'+*en* is higher with alternate and stative unaccusatives than other verb classes, 13.5% and 10%, respectively.

The results of the grammaticality judgment test and the cloze test reveal that the subjects are inconsistent in judgment and use. Overall, Zobl's claim is supported, but incorrect causativisation of (monadic) unaccusativity is observed in Balcom's data, which contradicts Zobl's claim.

5.2.4 Oshita (1997, 1998)

Oshita focuses on some non-target phenomena with English intransitive verbs observed in adult L2 learners. He searched the Longman Learners Corpus (Version 1.1., March 1993) for essays written by native speakers of Italian, Spanish, Japanese and Korean. 3362 essays were extracted from the entire corpus. The breakdown of the number of essays and the L1 groups was 684 for Italian, 1079 for Spanish, 236 for Korean, and 1363 for Japanese. From the whole set of essays obtained as a research corpus, the sentences with 10 preselected unaccusative verbs and 10 preselected unergative verbs were separated and classified into the 10 structural patterns in the following list.

(243) Syntactic patterns for classification of token sentences with unaccusatives

- | | |
|---------------------------------------|--|
| a. NP-V | e.g., Three boys arrived. |
| b. NP- <i>be</i> -Ven | e.g., Three boys were arrived. |
| c. <i>there</i> -V-NP | e.g., There arrived three boys. |
| d. <i>it</i> -V-NP | e.g., It arrived three boys. |
| e. <i>pro</i> -V-NP | e.g., Arrived three boys. |
| f. <i>there-be</i> -Ven-NP | e.g., There was/were arrived three boys. |
| g. <i>it-be</i> -Ven-NP | e.g., It was/were arrived three boys. |
| h. <i>pro-be</i> -Ven-NP | e.g., Was/were arrived three boys. |
| i. NP ₁ -V-NP ₂ | e.g., The bus arrived three boys. |
| j. <i>there-be</i> -NP-V | e.g., There was/were three boys arrived. |

941 token sentences were obtained in total. The occurrence of each structural pattern for unaccusatives by each L1 group is presented in Table 5-1.

Table 5-1. Overall syntactic distribution of unaccusative verbs (Oshita 2000:309)

structural patterns	Italian	Spanish	Korean	Japanese	Total
a. NP-V	216	327	39	269	851
b. NP- <i>be</i> -Ven	8	5	8	17	38
c. <i>there</i> -V-NP	2	0	1	1	4
d. <i>it</i> -V-NP	5	6	1	1	13
e. ϕ -V-NP	7	8	0	1	16
f. <i>there-be</i> -Ven-NP	0	0	0	4	4
g. <i>it-be</i> -Ven-NP	0	0	0	0	0
h. ϕ - <i>be</i> -Ven-NP	0	0	0	0	0
i. NP ₁ -V-NP ₂	2	1	1	7	11
j. <i>there-be</i> -NP-V	0	0	0	4	4
Total	240	347	50	304	941

The corpus data shows that overall unaccusative verbs are correctly used by L2 learners, stemming from the majority of sentences which appear in NP-V. Oshita (1998) remarks that it is quite unexpected that 90.4% of the obtained 941 token sentences with unaccusative verbs were free from errors. However, he also points out that the results should not easily lead to the conclusion that the acquisition of unaccusative verbs is non-problematic. He writes that errors with unaccusative verbs are relatively seen in advanced L2 learners. Oshita (1998:496) summarises the findings obtained from his corpus data as follows:

- (244) a. "Passivized" unaccusatives and inchoatives are produced.
- b. Postverbal NP structures are produced on unaccusatives by Italian and Spanish speakers.
 - c. Postverbal NP structures on unaccusatives are very rare among L1 Korean and Japanese speakers.
 - d. Non-target causativization of unaccusatives exists.
 - e. L2 learners exhibit a tendency to reject unaccusatives and inchoatives in the canonical NP-V word order.
 - f. There exists a clear contrast in the ways unaccusative-inchoatives and unergatives are used and perceived: there is no existence of "passivization", postverbal NP structures, non-target causativization, or tendency to reject the NP-V word order on unergatives.
 - g. In general, unaccusative verbs are correctly used in L2 English.
 - h. Errors, however, appear to afflict relatively advanced learners.

Oshita (1998) points out that the phenomena in the list are classified into 4 types based on their nature; lexical for (244f), syntactic for (244a) and (244e), syntactic and also cross-linguistic for (244b) and (244c), finally developmental for (244h). In order to give a proper unified account to these phenomena, Oshita (1998) proposed the Unaccusative Trap Hypothesis. This hypothesis posits three different developmental stages associated with the realisation and disappearance of the non-standard forms. To summarise each stage briefly, at the first stage, learners do not make a distinction between unergatives and unaccusatives, and project the single argument of unergative and unaccusative verbs as its external argument by adopting the “Single Argument Linking Rule.” This is not detected by observing their grammar. Then, learners move on to the second stage where they start producing ‘passive’ unaccusatives, because they find out that the single argument is not an external argument but an internal argument, but still do not know that the internal argument of unaccusatives does not need to be marked with passive morphology. Finally, learners reach the third stage by replacing their wrong assumption with the correct one. However, Oshita makes a cautious conclusion about learners’ reaching the third stage. He suspects that only a small proportion of advanced (near-native) learners would be able to reach the third stage.

5.2.5 Juffs (1996)

Juffs (1996) investigated the acquisition of the syntax-semantics correspondences by L2 learners within the framework of the Principles and Parameters theory. He focuses on cross-linguistic difference in structure between English and Chinese. To describe the semantic structure, Juffs employs a decompositional theory of word meaning, which assumes that a verb’s meaning is composed of semantic primitives such as conceptual categories (e.g. THING, STATE, PATH) and functions (e.g. ACT, GO, BE), as used in Pinker (1989) and Jackendoff (1990). Applying the L-syntax⁹ approach from Hale and Keyser (1992; 1993), where semantic representations are constrained in an X-bar configuration, Juffs proposes a “Root morpheme ‘STATE’ conflation parameter” shown in Table 5-2, to provide a unified account for a difference between English and Chinese in semantic properties and syntactic privileges.

⁹In the L-syntax approach, a representation in the X-bar configuration itself shows linking rules between lexical semantic structure and argument structure – the Agent originates as the specifier of a CAUSE subpredicate, and the Theme/Patient originates as the specifier of BECOME.

Table 5-2. Root Morpheme CAUSE/STATE Conflation Parameter (Juffs 1996:92)

[ACT(effect) [GO [STATE]]]	
Transitive psych verbs	(i)*Nei ben shu shiwang le Zhang San
(i)The book disappointed Mary	That CL book disappoint ASP Zhang San.
Transitive change of state	(ii)??Taiyang rong (hua) le xue.
(ii) The sun melted the ice.	Sun melt ASP snow
Container locative verbs	(iii)? Zhang San yong tanzi gai le chuang
(iii) John covered the bed with a blanket.	Zhang San use blanket cover ASP bed
	'Zhang San covered the bed with a blanket.'
(iv)*John covered the blanket onto the bed	(iv) Zhang San wang chuang shang gai le tanzi.
	Zhang San to bed on cover ASP blanket
	'Zhang San covered the blanket onto the bed.'
e.g.English, Romance, Bulgarian, Russian	Chinese, Tagalog, Japanese, Chechen,German??

Juffs assumes that Chinese is different from English in that it may not allow the meaning components ACT (CAUSE) and STATE to co-occur in a root morpheme. He supposes that this difference may make possible in Chinese some alternations which English does not permit. To take container verbs in Chinese as an example, the conflation parameter predicts that Chinese native speakers would correctly accept alternations of Chinese locative verbs, but English speaking learners of Chinese would not allow verbs to alternate and reject the one which has Theme object such as (iv). Based on learnability theory, Juffs assumes certain hypotheses, which can be summarized in the following points:

- (245) a. Native speakers of English and Chinese will perform in the way predicted by the conflation parameter.
- b. Only positive evidence in L2 input will play a role as a trigger for parameters as in L1 acquisition.
- c. Chinese learners of English will overgeneralise the L1 patterns of the semantic-syntactic correspondence to L2 before fully acquiring the L2 pattern.
- d. Negative evidence will not be of help to recover from the overgeneralizations, but direct positive evidence will be enough to raise the learners' sensitivity to the morphological differences.

To attest these hypotheses, an experimental study was carried out with a total of 120 Chinese learners of English. The participants were divided into five different groups based on the university year: two first-year university classes as a low level group, a second-year university class as an intermediate level, a fourth-year university class as a

high level group, postgraduate students as an advanced level group, and monolingual Chinese and English speakers as native control groups. The results of the proficiency test which they took produced significant differences between these groups, which validated the classification. There were three tasks employed for the empirical study: a. Verb-meaning test, b. Production task, and c. Grammaticality Judgment task.

a. Verb-meaning test

The results of the verb-meaning test revealed that there were at least one or two items for each verb class which many low-level learners are not familiar with. The verb *bore* was excluded from analysis, because it was unknown to the students at any level. Apart from that, the decision about whether a particular item should be included in the analysis was made on an individual basis.

b. Production task

The results of the Production test will not be discussed in detail here, because the sentences which were actually produced by the participants are not presented in Juffs' paper. Juffs (1996) gives the summary of the data showing that significant differences are only produced with the verb classes affected by the parameter. Furthermore, these differences were not found in the data of the high and advanced learners but in that of the low and intermediate learners, which suggests that transfer from the L1 is likely to occur only in the early stages of acquisition.

c. The Grammaticality Judgment task

Overall learners at all levels seem to be aware that Theme object is allowed with alternator verbs but not with container verbs, because their judgments clearly distinguished between the two types of verb. Comparing the data of the L2 learners to that of English native speakers, the distinction between these verbs is not as great as that made by the native controls.

Turning to the results of the psych verbs, Juffs examines them in the relation between the proficiency levels and the parameter setting. From a developmental point of view, Juffs suggests that low-level learners have inconsistent intuitions about the L2, which gradually improves as learners approach the intermediate level. At the high level, their parameter seems to have almost reset, but more than half failed to pre-empt the L2 representations transferred from the L1. Also, the learners show a preference for the periphrastic constructions of the psych verbs, which confirms that L1 transfer still

remains.

The results do not show significant differences between learners and the native speakers in the production task but they do in the grammaticality judgment test. Juffs' claim is that the acquisition of the conflation pattern in Chinese is problematic for learners, but resetting the Root Morpheme STATE Conflation Pattern would be the key to the success of the acquisition.

5.2.6 Sorace (1993a, 1993b, 1995a)

Sorace (1993a, 1993b, 1995a) investigates the acquisition of the syntax of unaccusativity in Italian L2 and French. Focusing on the fact that French and Italian are similar in their auxiliary selection behaviour, but English and Italian are not, she conducted experimental studies for English and French speakers of Italian (Sorace 1993a), and French Speakers of Italian (Sorace 1993b), and on Italian learners of French (Sorace.1993b) As her theoretical basis, Sorace (1993) presents an "Unaccusative Hierarchy", which was developed by examining lexical-semantic representations and their interactions with the syntactic domain.

Table 5-3. Unaccusative Hierarchy¹⁰ (Sorace 1993:32)

Verb type	Dimension	Diachronic	French aux	Italian aux
<Unpaired unaccusatives>	CONCRETE	-open to	<i>être</i>	<i>essere</i>
change of location	MOVEMENT	<i>habere</i> -reflexes	<i>être/avoir</i>	<i>essere</i>
change of condition	↑↓	↑	<i>avoir</i>	<i>essere</i>
continuation of a condition	↓	↑	<i>avoir</i>	<i>essere</i>
existence of a condition	ABSTRACT	+open to	<i>avoir</i>	<i>essere</i>
	STATICITY	<i>habere</i> -reflexes		
<Paired unaccusative>		↓		
with transitive alternant			<i>avoir</i>	<i>essere</i>
with unergative alternant			<i>avoir</i>	<i>essere</i>

The hierarchy is based on two pairs of dimensions, concreteness/abstractness, and movement/staticity, and reflects diachronic evidence with *habere*-reflexes. The hierarchy shows that French exhibits more variation in auxiliary selection than Italian, because French selects *être* only with the verb types of "change of location" and

¹⁰The unaccusative Hierarchy presented in Sorace (1993a, 1993b) has been revised and renamed as the Split Intransitive Hierarchy in Sorace (2000) (see section 2.2.3.1.2 for details)

“change of condition” and selects *avoir* for all other verb types, but Italian selects *essere* for all the verb types on the hierarchy. Based on the unaccusative hierarchy, a series of studies (Sorace 1993a, 1993b) was conducted to address different issues on L2 acquisition. I briefly review here the methodology and results of each study.

Sorace (1993a) investigated the ultimate attainment of 20 French L1 and 24 English L1 near-native speakers of Italian L2, characterised by two distinct states of grammatical competence; divergence (from native grammars) and incompleteness (of the native grammar). The three properties of unaccusativity tested were as follows:

(246) *Essere* –selection

a. Maria è venuta alla festa da sola

Maria came to the party alone

b.* Carla ha venuto al cinema con noi.

Carla came to the cinema with us

(247) Optional auxiliary change in basic restructuring constructions:

a. Maria non ha potuto venire alla mia festa

Maria couldn't come to my party

b. Mia figlia non è potuta venire a scuola

My daughter couldn't come to school

(248) Optional auxiliary change in restructuring constructions with Raising verbs, where the clitic remains attached to the embedded verb:

a. Alla mia festa, Maria non ha potuto andarci

To my party, Maria couldn't go

b. A scuola, mia figlia non è potuta venirci

To school, my daughter couldn't come

(249) Obligatory auxiliary change in restructuring constructions with Raising verbs, where the clitic ‘climbs’ to the main verb:

a. * Alla mia festa, Maria non ci ha potuto andare

To my party, Maria couldn't go

b. A scuola, mia figlia non ci è potuta venire

To school, my daughter couldn't come

(extracted from Sorace 1993:34)

As shown in (247), the restructuring construction with raising verbs whose clitic remains attached do not require a change of auxiliary, while the restructuring

construction with raising verbs whose clitic climbs to the main verb does require change of auxiliary, as shown in (248). The judgments by French near-native speakers of Italian were determinate, and very similar to those by Italian native speakers with obligatory change of auxiliary, while they were different with optional change of auxiliary. The English near-native speakers of Italian were indeterminate in their judgments about all restructuring constructions, no matter whether they are grammatical or ungrammatical, optional or obligatory.

Sorace (1993b) investigated two different issues: indeterminacy in auxiliary selection, and the learnability problem arising from the inconsistency of the French auxiliary system (learning asymmetries), having 19 advanced Italian non-native speakers of French and 20 French non-native speakers of Italian. The properties investigated in this study were unpaired, non-reflexive unaccusative verbs, which are categorized in seven types along the Unaccusative Hierarchy. In this study, the "change of condition" was further classified into two types: one is verbs which select the same auxiliary between Italian and French (i.e. *essere* in Italian and *être* in French); verbs which select different auxiliaries between Italian and French (i.e. *essere* in Italian and *avoir* in French). Table 5-4 shows the contrast between Italian and French with the test items used.

Table 5-4 : The auxiliary selection in Italian and French with the test items used

	Italian		French		
<i>Type of unaccusative</i>	<i>verb</i>	<i>essere</i>	<i>avere</i>	<i>être</i>	<i>avoir</i>
CHANGE OF LOCATION		andare		aller	
		venire		venir	
		uscire		sortir	
CHANGE OF CONDITION		cadere		tomber	
(I=F)		diventare		devenir	
CHANGE OF CONDITION		sparire			disparaître
(I≠F)		invecchiare			vieillir
		arrossire			rougir
CONTINUATION OF A CONDITION		durare		durer	
		sopravvivere		survivre	
EXISTENCE OF A CONDITION		esistere		exister	
		sembrare		sembler	
		appartenere		appartenir	
WITH TRANSITIVE ALTERNANT		aumentare		augmenter	
		affondare		couler	
		cambiare		changer	
WITH UNERGATIVE ALTERNANT		rotolare		rouler	
		correre		courir	
		saltare		sauter	

Each sentence consists of two versions; one with the correct auxiliary and the other with the incorrect auxiliary as illustrated in (250).

- (250) a. Maria è andato a casa
'Maria has gone home'
- b. *Maria ha andato a casa
'Maria is gone home'

The results indicate an asymmetrical pattern in the acquisition of unaccusative auxiliary selection. The French learners of Italian show a very similar pattern in their judgments to that of the native Italian speakers, which confirms that they have internalised the L2 Italian, while the judgments of Italian learners of French show a reversed gradient effect along the hierarchy, that is, they judged core verbs as less unacceptable than peripheral verbs. Sorace gives a plausible account of this by referring to the relationship between the L1 and L2 linking rule. She suggests that this should stem from the fact that French has a more narrow-range rule than Italian, and Italian learners have to restrict the range of their linking rule, which governs the mapping of lexical-semantic representations. This resetting process will give them more difficulty.

Finally Sorace (1995a) examined the acquisition of the syntax of unaccusativity in Italian L2 from the developmental perspective with four groups of English-speaking learners of Italian L2: 32 beginners, 36 intermediates, 32 advanced learners and 24 near natives. A total of 32 sentences were presented in Sorace (1995a), exemplifying three types of the unergative hierarchy and five verb types of the unaccusative hierarchy. Each verb is presented twice in the two constructions and with *essere* and *avere*.

The results reveal that as their proficiency level gets higher, the pattern of their judgments becomes more similar to that of native speakers' concerning strength of preference. With respect to the results for unaccusative verbs, lower proficiency levels gave indeterminate judgments regardless of the coreness of verbs, while the strength of auxiliary preferences is conditioned along the hierarchy for the higher proficiency groups.

Overall the results of the three studies share the finding that syntactic acquisition in terms of split intransitivity is sensitive to the the position of verbs on the split

intransitivity hierarchy. In addition, the degree of difficulty is highly dependent on the characteristics of the language, for example, whether it has systematic evidence of split intransitivity, or whether it has syntactic manifestation of the unaccusative/unergative distinction.

5.2.7 Yuan (1996)

Yuan (1996) reports on the acquisition of the syntax of unaccusativity in Chinese by English-speaking learners. The unaccusative-unergative distinction is syntactically manifested also in Chinese in the fact that the single argument of an unaccusative optionally remains in situ and appears in postverbal position. This phenomenon is optional, thus the single argument can occur in preverbal position as well, but the postverbal NP is only allowed when the argument NP is indefinite. In contrast, unergative verbs do not allow the single argument to appear in postverbal position regardless of whether the argument VP is indefinite or not. Examples are shown in (251) and (252).

- (251) a. shang ge yue, san sou chuan zai zhe ge hai yu chen le
 last CL month three CL ship in this CL sea area sink PFV
 'Last month, three ships sank in this sea area.'
- b. shang ge yue, zai zhe ge hai yu chen le san sou chuan
 last CL month in this CL sea area sink PFV three CL ship
 'Last month, three ships sank in this sea area.'
- c. *shang ge yue, zai zhe ge hai yu chen le na sou chuan
 last CL month in this CL sea area sink PFV that CL ship
 'Last month, that ship sank in this sea area.'

- (252) a. Ji ge haizi zai chuang shang tiao
 a few children in bed on jump
 'A few children jumped on top of the bed'
- b. *zai chuang shang tiao ji ge haizi
 in bed on jump a few children
 'A few children jumped on top of the bed.'

(Yuan 1996:203)

In order to find out whether learners of Chinese at different levels are aware of this

difference in syntactic manifestation between unaccusative and unergative verbs, Yuan conducted an experimental study for 48 English-speaking learners of L2 Chinese, who were divided into 4 proficiency levels, along with the 14 Chinese native speakers. There were two tasks used for this study: an oral picture-description task and a sentence-acceptability judgment task. The picture description task asked the participants to describe 9 pictures, which were categorized into three different types as in (253).

(253) Verbs used in describing the three types of pictures

Type A (externally caused verbs): *po* 'break'; *dong* 'freeze'; *biye* 'graduate'

Type B (verbs of directed motion): *diao* 'fall'; *tiao xialai* 'jump down'; *taopao* 'escape'

Type C (agentive internally caused verbs): *pao* 'run'; *pa* 'creep'; *xiao* 'laugh'.

(Yuan 1999:282)

With respect to the judgment task, the participants were asked to indicate their judgments on the test sentences with a five-point scale. The sentences consisted of eight sentence types, which are shown in (254):

(254) Types of sentence used in the acceptability judgment test

Type 1. Externally caused verbs with internal argument in object position (*break+NP*)

Type 2. Externally caused verbs with internal argument in subject position (*NP+ break*)

Type 3. Externally caused verbs with internal argument in object position as a definite NP
*(*break +def-NP*)

Type 4. Inherently directed verbs with internal argument in object position (*come+NP*)

Type 5. Inherently directed verbs with internal argument in subject position (*NP+come*)

Type 6. Agentive verbs of manner of motion with the single argument in subject position
(*NP+jump*)

Type 7. Agentive verbs of manner of motion with the single argument in object position
*(*jump+NP*)

Type 8. Agentive verbs of manner of motion with directional phrases with the single argument in object position (*jump+direction+NP*)

(extracted from Yuan 1999: 283-284)

To summarise the results from the oral picture description task, none of the groups had any problem with producing the sentences with preverbal arguments, which showed almost perfect correctness. In contrast, the results of postverbal NP sentences varied

among the proficiency levels, which revealed some interesting tendencies- the higher their proficiency level in Chinese gets, the more the participants produced postverbal NP sentences. That is, Group 1 hardly used postverbal argument constructions, on the contrary, Groups 2 and 3 produced them more, and ended up as an overgeneralizing them to unergative verbs as shown in (252b).

With respect to the results of the acceptability judgment test, it reveals a kind of developmental path in terms of emergence and disappearance of the postverbal NP structure. At the initial stage, Group 1 simply rejected the postverbal NP sentences across the board. Secondly, Groups 2 and 3 accepted the postverbal NP type of sentences without making any distinction between unaccusatives and unergatives, which means they wrongly accepted the postverbal NP sentences with unergative verbs.

Finally, as for Group 4, since their judgments were quite varied, Yuan further divided the group into 3 subgroups based on the tendency of their judgments. Interestingly, the first two subgroups A and B behaved like Group 1 and Group 2, respectively. The third subgroup, named subgroup C, showed the best performance, which was much closer to that of the Chinese natives' than any other groups. They correctly accepted the postverbal NP sentences with unaccusative verbs, while they accurately rejected them with unergative verbs.

On these grounds, Yuan attempts to give his alternative account for the results without applying the concept of learnability. His account assumes three developmental stages. To start with, at the early stage, L2 learners are much more sensitive to the word order of L2 than to subtle syntactic differences which arise from the lexical-semantic differences, thus they just set their grammar to the basic Chinese word order S-VP.

Then, being exposed to more sentences with the postverbal NPs, learners make a wrong assumption that the postverbal NPs are allowed regardless of the verb type, and just accept the postverbal NP construction with any verb.

Finally, learners start restructuring in the word order; they reset the word order to S-VP, and reject all sentences with postverbal arguments, but the positive evidence gradually makes learners aware that only unaccusatives allow postverbal arguments, which leads to success in resetting their grammar.

5.2.8 Hirakawa (1999, 2000, 2001)

Hirakawa (1999, 2000, 2001) investigates the acquisition of unaccusativity in English speaking learners of Japanese and Japanese speaking learners of English in two experimental studies. Four independent experimental studies were conducted in Hirakawa (2000). The first two studies, Study I and Study II are English studies, which tested the resultative and pseudopassive constructions, and NP movement in English unaccusatives and the overgeneralisation of passive morphology on unaccusative verbs, respectively. The other two studies, Study III and Study IV are on Japanese. Study III targeted five structures including (i) the *te-iru* construction, (ii) the *takusan* 'a lot' construction, (iii) resultatives, (iv) the *taisita-nai* 'not very good' construction, and (v) Case drop, and Study IV aimed at investigating Causatives, Causative-Passives, and Indirect Passives. The methodology used in each study and the main results will be briefly summarised here.

Study I

Study I was conducted to investigate L2 acquisition of unaccusatives and unergatives at the deep level in Japanese-speaking learners of English. Two different tasks were employed for this study: an Elicited Production Task and a Grammaticality Judgment Task. There were 18 Japanese speaking learners of English and 10 native speakers of English who participated in this study.

a. Elicited Production Task

A written elicited production task was designed to investigate whether incorrect use of passive morphology to unaccusative verbs would be produced in L2 English as in (255).

(255) * The moon was appeared in the sky

(Hirakawa 2000:130)

A total of 20 test items with 4 verb categories (transitives, unergatives, alternating unaccusatives, non-alternating unaccusatives) were included in the test. The results of the production task show that L2 learners performed quite well on unergatives and unaccusative II (non-alternating unaccusatives), but they were less accurate with transitives and unaccusative I (alternating unaccusatives). 23.3% of the responses with unaccusatives were incorrect including incorrect passivisation, and 17.8% of the responses with transitives were wrong by failing to apply the passive construction to them (ex. **The novel read around the world*).

b. Grammaticality Judgment Task

A grammaticality judgment task was used to test two different structures: resultatives and pseudopassives. There were three types of resultative sentences included as in (256):

(256) a. Transitive (acceptable)

ex. The rope was too long.

So I cut the rope in two.

b. Unergative (unacceptable)

ex. Mary went to a disco and stayed there all night.

*She danced tired.

c. Unaccusatives (acceptable)

ex. Susan didn't have her hair cut for 6 months.

Her hair grew long.

(Hirakawa 2000:132)

The pseudopassive was employed to see whether L2 learners are aware that unergatives allow Pseudopassive structure, while unaccusatives do not. Examples of the sentence types included were as follows:

(257) a. Transitive (acceptable)

ex. Mary was watching the opening of the building.

When the ribbon was cut, everybody clapped.

b. Unergative (acceptable)

ex. There was a good recording studio in the city.

But that studio was never sung in until yesterday.

c. Unaccusative II (unacceptable)

ex. These stairs are very steep.

*The stairs are often fallen down by children.

(Hirakawa 2000:132)

The results for pseudopassives reveal that L2 learners performed similarly to the English native speakers on transitives and unaccusatives, while they show an opposite pattern in their judgments of unergatives, by rejecting the pseudopassive sentences with unergatives. However, Hirakawa points out that their rejection of unergatives is not as strong as that of unaccusatives, which makes it plausible to say that the

unergative/unaccusative distinction is assumed by the learners.

Study II

Study II examined knowledge of surface unaccusativity, which represents that the unaccusative argument remains in the object position at the level of syntactic configuration. Hirakawa supports the “no NP movement analysis” for Japanese unaccusatives, in the manner proposed by Kageyama (1993), Nishigauchi (1993) and Yatsushiro (1999), and gives a summary of NP movement and morphology in constructions in Japanese and English as in Table 5-5.

Table 5-5. NP movement and morphology in the construction

	Japanese	English
Unaccusative	-NP movement +morphology	+NP movement -morphology
Passive	+NP movement +morphology	+NP movement +morphology

(Hirakawa 2000:144)

There were two different tasks employed for this study: an Elicited Production Task, and a Grammaticality Judgment Task. A total of 22 Japanese-speaking learners of English and 14 native speakers of English participated in this study.

a. Elicited Production Task

The production task was designed to examine whether L2 learners would show incorrect use of passive morphology in unaccusative verbs. The results of the Elicited Production Task show that L2 learners had a problem of incorrect passivised forms only with alternating unaccusatives but not with non-alternating unaccusatives. This is parallel to the results in Study I. Hirakawa (2000) points out that there were also similar errors with transitive verbs, stemming from their failing to apply passive morphology to transitive verbs (ex. *A high-rise apartment built in the park*).

b. Grammaticality Judgment Task

The grammaticality judgment task consists of four types of sentences: intransitive, short passive (without a by-phrase), full passive (with a by-phrase) and transitive. An example follows:

- (258) a.intransitive The other one melted.
 b.short passive The other one was melted.
 c. full passive The other one was melted by the sun.
 d. transitive The sun melted the other one.

(Hirakawa 2000:148)

The results of the grammaticality judgment task show that L2 learners' performance was quite similar to the natives'. Further analysis by ANOVA revealed that L2 learners have knowledge about the correct intransitive construction and the incorrect passivised unaccusatives. However, they were less accurate with the intransitive structure with alternating unaccusatives than with non-alternating unaccusatives.

Study III

Study III investigated L2 acquisition of Japanese unaccusative and unergative verbs at two syntactic levels; D-structure and S-structure. Five structures were tested by two different tasks: a Picture task and an acceptability judgment task, which are presented by the table in Hirakawa (2000) as in Table 5-6.

Table 5-6. Constructions used in Study III

	Constructions	Objective
Picture Task I	the <i>-teiru</i> construction	meanings (telicity)
Picture Task II	the <i>takusan</i> construction	deep unaccusativity
	the resultative construction (transitive and unaccusative verbs)	deep unaccusativity
Acceptability Judgment Task	the resultative construction (unergative verbs)	deep unaccusativity
	the <i>taishita-nai</i> ¹¹ construction	deep unaccusativity
	Case drop	surface unaccusativity

(Hirakawa 2000:168)

¹¹Nishigauchi (1993:165) proposes that the negative polarity item "*rokuna- (nai)*" cannot modify an external argument but rather an internal argument. This discussion is parallel to these for the Split Intransitivity mentioned in Chapter III. Based on Nishigauchi's proposal, Hirakawa (2000) employed the equivalent construction *taishita-nai* 'not very good'. Like *rokuna-nai*, '*taishita-nai*' modifies only the object

There were 25 adult native speakers of English studying in Japan and 20 native speakers of Japanese who participated in this study. Results will be summarized by each task briefly.

a. Picture Task I

The interpretation of the ‘-*teiru*’ construction was examined with Picture Task I, which consisted of 15 sentences with the –*teiru* construction based on three types of verbs: transitives, unergatives and unaccusatives. The participants were expected to choose the picture describing a progressive interpretation for transitive and unergative sentences, and the picture describing a resultant state for unaccusative sentences. The results reveal that overall the L2 learners chose the correct reading, which implies that the learners were sensitive to the notion of telicity and made a distinction between the two different readings which the –*teiru* construction exhibits.

b. Picture Task II

Picture Task II was designed to investigate the representation of deep unaccusativity in the L2 learners grammar by focusing on the *takusan* construction and the resultative construction. Deep unaccusativity represents the argument of an unaccusative verb base-generated in the object position (i.e. the complement of the verb) at D-structure. A total of 52 pictures each paired with a sentence in Japanese were presented, which consisted of 25 with *takusan* ‘a lot’, 10 with resultatives and 17 distracters. The picture task with *takusan* ‘a lot’ was tested on transitive, unergative, and unaccusative sentences. Examples of each sentence are as follows.

- (259) a. **Transitive sentences with pictures in which one subject performs an action denoted by the verb on a lot of subjects (true picture/sentence pairings):**

Takusan yom-imasi-ta
a lot read-Polite-Past
‘One person read a lot (of things).’

[PICTURE]

- b. Transitive sentences with pictures in which a lot of subjects perform an action denoted by the verb on one object (false picture/sentence pairings):**

Takusan yom-imasi-ta
a lot read-Polite-Past
'A lot of people read something'
[PICTURE]

- c. Unergative sentences with pictures in which one subject performs an action denoted by the verb for a long period/distance etc. (true picture/sentence pairings):**

Takusan oyog-imasi-ta
a lot swim-Polite-Past
'One person swam a lot'
[PICTURE]

- d. Unergative sentences with pictures in which a lot of subjects perform an action denoted by the verb (false picture/sentence pairings):**

Takusan oyog-imasi-ta
a lot swim-Polite-Past
'A lot of people swam'
[PICTURE]

- e. Unaccusative sentences with pictures in which a lot of subjects undergo an action denoted by the verb (true picture/sentence pairing)**

Takusan oti-masi-ta
a lot fall-Polite-Past
'A lot (of things) fall.'
[PICTURE]

(Hirakawa 2000:173-175)

An identical sentence appeared twice with different pictures describing different readings with unergatives and unaccusatives, but each unaccusative sentence was presented only once with one type of picture displaying the quantified NP reading (see section 3.1.5 for details). The learners were asked to indicate whether the sentence

correctly described the picture by choosing 'true' or 'false'. The results of the *takusan* construction show that all three groups correctly distinguished between the subject and object of transitives. Also, they generally succeeded in making a distinction between unergatives and unaccusatives, but the advanced learners did not perform as well as the intermediate learners. Hirakawa speculates that this may be due to the invalidity of the proficiency test which all the subjects took at the beginning. The results of resultatives just confirm that all the groups correctly accepted the transitive and unaccusative sentences, which are grammatical, which suggests that they are aware of the similarity between the object of transitive and the subject of unaccusative modified by resultative phrases.

c. Acceptability Judgment Task

Three types of construction were tested by means of acceptability judgment: resultatives (with unergative verbs), the negative *taisita-nai* construction and Case drop. Resultative sentences included only one type: resultatives with unergative verbs, while *taisita-nai* construction consisted of four types of sentences.

(260) a. **Transitive sentences where the subject is modified (unacceptable)**

*taisita gakusei-ga ronbun-o kakanai
 very good student-Nom papers-Acc write not
 'Not very good students write papers.'

b. **Transitive sentences where the object is modified (acceptable)**

Gakusei-ga taisita ronbun-o kakanai
 student-Nom very good paper-Acc write not
 'Students do not write very good papers'

c. **Unergative sentences where the subject is modified (unacceptable)**

*?Taisita hito - ga hasira-nai
 very good people-Nom run - not
 'Not very good people run.'

d. **Unaccusative sentences where the subject is modified (acceptable)**

Taisita hito- ga ko-nai
 very good people-Nom come-not
 'Not very good people will come.'

(Hirakawa 2000:178)

Case drop includes four sentence types as follows:

(261) a. **Transitive [subject Case drop]**

Which	Subj NP- ϕ	object NP-o	V?(unacceptable)	
Dono	gakusei	sinbun-o	yomimasita ka	
which	student	newspaper-Acc	read	Q

“Which student read the newspaper?”

b. **Transitive [object Case drop]**

Subj	NP-wa	which	object NP- ϕ	V?(acceptable)
Yamada-san-wa	dono	sinbun	yomimasita ka	
Yamada-Mr-Top	which	newspaper	read	Q

“Which newspaper did Mr. Yamada read?”

c. **Unergative [subject Case drop]**

Which subject	NP- ϕ	V?(unacceptable)
Ano puuru-de	dono gakusei	oyogimasita ka
that pool-in	which student	swam

Q
“Which student swam in that pool?”

d. **Unaccusative [subject Case drop]**

Which subject	NP- ϕ	V? (acceptable):
Ano kawa-ni	dono-hito	otimasita ka
that river-in	which person	fell

Q
“Which person fell in the river?” (Hirakawa 2000:180)

The results of resultatives suggested that the two learner groups may not be aware that unergatives with resultatives are ungrammatical. Their mean scores of judgments fall around zero, while native controls indicate about -1.4, which means that they reject this form strongly. Individual analyses which were further carried out revealed that both of the learner groups were not as accurate as the native controls in rejecting ungrammatical resultatives with unergative verbs, and that the intermediate group performed a little better than the advanced group.

With regard to the results of the *taisita-nai* construction, the learners group did not show the unaccusative/unergative contrast in spite of succeeding in making the transitive subject/object distinction. In contrast, the native controls clearly differentiated between transitive subject/object, and unaccusative/unergative.

Finally, the results of Case Drop were rather different from the prediction. Not only the learner groups but also the control group failed to differentiate between unergatives and unaccusatives in terms of Case Drop. Interestingly, the learner groups and the controls showed an opposite pattern in their judgments, that is L2 groups accept both sentence types, while the controls reject both sentence types. Hirakawa gives a possible account for this- the written judgment task may not be appropriate as an eliciting technique for Case Drop, because this is a phenomenon evident only in spoken language.

Study IV

Study IV examined L2 acquisition of Japanese unaccusatives and unergative verbs at the surface level. Three different syntactic structures were tested by means of acceptability judgment task: Causatives, Causative-Passives, and Indirect Passives. There were 7 sentence types included in the acceptability judgment task. Each type and examples are as follows:

(262) a. **Causatives with transitive verbs (acceptable):**

Sensei – ga gakusei – ni kokana hon – o kaw-ase-ta
 Teacher-Nom students-by expensive book-Acc buy-Caus-Past
 “The teacher caused the students to buy the expensive book (inanim.).”

b. **Transitive subjects as surface subjects (acceptable):**

Gakusei-ga sensei-ni kokana hon – o kaw-as-are-ta
 students-Nom teacher-by expensive book-Acc buy-Caus-Pass-Past
 “The students were caused to buy the expensive textbook by the teacher.”

c. **Transitive objects as surface subjects (unacceptable)**

*Kokana hon-ga sensei-ni yotte gakusei-ni kaw-as – are - ta
 expensive book-Nom teacher-to owing students-by buy-Caus-Pass-Past
 “The expensive book was caused to be bought by the students by the teacher.”

d. Unergative (acceptable):

Taro-ga hatarak-as-are-ta
Taro-Nom work-Caus-Pass-Past
“Taro was caused to work.”

e. Unaccusative (unacceptable):

*Kanzya- ga sin- as - are- ta.
patient-Nom die-Caus-Pass-Past
“The patient was caused to die.”

A total of 21 adult native speakers of English studying in Japan and 21 native speakers of Japanese took part in the experiment. They were asked to indicate their judgments on the test sentences by choosing among ‘acceptable’, ‘unacceptable’ or ‘don’t know’.

Group results of Causative show that both L2 learners and Japanese controls correctly accepted the causative sentences. Causative-passives consist of three types of sentences: Causative-passives with transitives, and Causative-passives with unergatives and Causative-passives with unaccusatives. The results with the first type (transitives) show that all the groups correctly make a distinction between transitive subject and transitive object. With respect to the second (unergatives) and the third (unaccusatives), the intermediate group failed to correctly differentiate between unergatives and unaccusatives, while the controls and the advanced learners successfully made a distinction between them.

Finally, indirect passives were tested on two different types of sentences: indirect passive with unergatives and indirect passives with unaccusatives. Similarly to the results of Causative-passives, the intermediate learners failed to make a distinction between unergatives and unaccusatives, while the controls and the advanced learners correctly differentiated between them.

5.2.9 Montrul (1997, 1999, 2000)

Montrul (1997,1999,2000) investigated the acquisition of the causative/inchoative alternation in English, Spanish and Turkish as second languages, especially in terms of the interaction of universal principles and L2 influence in interlanguage grammar. She points out that previous studies of the transitivity alternation failed to give proper

attention to the different L1 backgrounds among the participants, which made it impossible to trace back their errors to L1. Montrul's main interest was to explore the interaction of UG and L1 knowledge in the interlanguage grammar of three languages; English, Spanish, and Turkish, which share a similar semantic composition, but vary in the morphological manifestation of the alternation. Montrul provides a description of the transitivity alternation in English, Spanish, and Turkish. Let us look at this briefly here.

English does not manifest a derivational relationship between the transitive and intransitive with overt morphemes. For example, change of state verbs such as *break* can be either transitive or intransitive, as in (263).

(263) **English**

- a.. The man broke the window.
- b.The window broke.

However, this is not the case for other languages such as Spanish and Turkish. These languages encode the causative/inchoative alternation overtly as follows:

(264) **Spanish**

- a. *El enemigo hundió el barco*
"The enemy sank the ship"
- b. *El barco se hundió*
the ship REFL sank
"The ship sank"

(265) **Turkish**

- a. *Düşman gemi-yi bat- ir- miş.*
enemy ship-ACC sink-CAUS-PAST
"The enemy sank the ship"
- b. **Düşman gemi-yi bat- miş.*
enemy ship-ACC sink-PAST
"The enemy sank the ship"
- c. *Gemi bat-miş.*
ship sink-PAST
"The ship sank"

(Montrul 2000:235)

In Spanish, the intransitive form marks the verb root with the reflexive clitic *se*, while the transitive form is simple, as shown in (264). In contrast, Turkish marks the transitive form with the causative affix, *-Dir* or *t* as in (265a), thus the transitive form without the causative morpheme is ungrammatical as in (265b), while the intransitive form is simple as in (265c).

Montrul (1997,1999) conducted three studies, English, Spanish and Turkish, using the same test, a cloze test, a vocabulary translation task (VTT), and a picture judgment task. The cloze test and the vocabulary translation task were given to make sure of their proficiency levels and knowledge of the meaning of the lexical items, respectively, while the picture judgment task was used to test the main hypotheses.

1. How do L2 learners learn transitivity alternations? Do they make errors similar to those reported in L1 acquisition?
2. How do UG and the L1 constrain the acquisition of the lexicon in interlanguage grammars?
3. If L2 learners make errors, do similar developmental paths emerge in the three languages?

Montrul formulates hypotheses for each study with English, Spanish, and Turkish. Let us look at the hypotheses and the results, respectively.

The results of the picture judgment task are discussed from two perspectives: argument structure errors and morphological errors. First, the former reveals that overall learners were aware of the transitive possibilities of the verb types, but less accurate with the nonalternating classes than native controls, and wrongly accepted transitivity errors with transitive verbs, which confirms the findings by Moor (1993) and Hirakawa (2000) among others. Secondly, errors involving the derivational morphology show that the L1 has some important effect in the L2 acquisition of the morphological manifestation of alternation.

In the English study, the hypotheses posited with transitive and intransitive alternating verbs were: (a) the preference for periphrastic causative over lexical causatives by Turkish learners; (b) less accurate judgments with zero-derived intransitive forms by Spanish learners. Recall that Turkish encodes the transitive form with the causative

morpheme as in (265a), while Spanish marks the intransitive form with the reflexive clitic *se* as in (264b). The results contradict her prediction; the Turkish learners did not show any particular preference for sentences with the periphrastic verb *make*. With respect to intransitive alternating verbs, the results confirmed the prediction, and the Spanish groups rejected zero-derived forms more than the control group and the Turkish-speaking group.

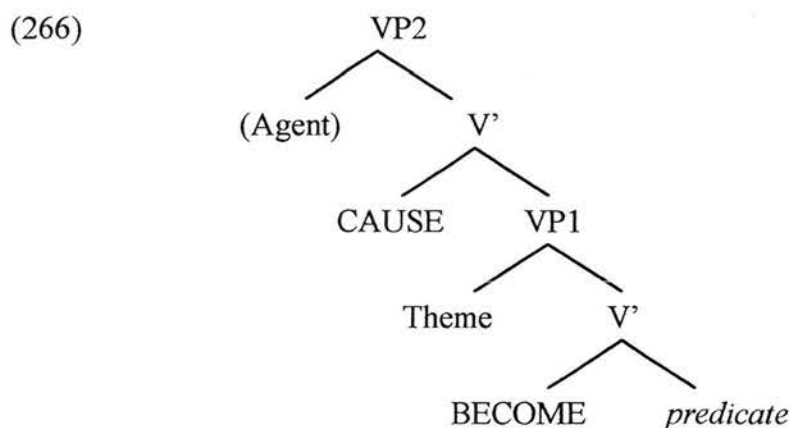
In the Spanish study, Montrul assumed the following hypotheses: (a) the preference for the periphrastic verb *hacer* “make” with transitive alternating verbs by the Turkish learners; (b) less accurate judgments with morphologically marked intransitive alternating verbs by the English-speaking learners, based on the facts that the transitive form is expressed with the causative morpheme in Turkish, and that English does not encode the causative/inchoative alternation with any overt morphology. As in the English study, the results contradicted the hypothesis with transitive alternating verbs and there was not any preference for the periphrastic verb seen in the Turkish learners. In addition, similarity to the results of the English study, the hypothesis with intransitive alternating verbs was confirmed by the results; the English learners were less accurate in their judgments with intransitive zero-derived forms.

In the Turkish study, the main hypotheses were: (a) tendency to omit of causative morpheme with transitive verbs by both Spanish- and English-speaking learners; (b) more accuracy with the zero-derived intransitive forms by the English-speaking learners, and more accuracy with the overt morphology of intransitive forms by the Spanish speaking learners. Recall that neither in Spanish nor English is there an obligation to mark the transitive form with the causative morpheme, though Spanish marks the intransitive form with the obligatory reflexive clitic *se*. As for Hypothesis (a), Montrul gives further predictions that English and Spanish learners of Turkish have no problem with accepting the causative morpheme in transitive sentences, but failed to reject incorrect sentences without the required causative morpheme. The results with the intransitive alternating verbs were contrary to her prediction; there was no asymmetry pattern seen in their responses. On the contrary, both English- and Spanish-speaking learners showed a similar tendency; they accurately accepted zero-derived intransitive, while wrongly rejecting intransitive forms with anticausative morphology.

Montrul discusses the findings of these three studies in terms of two issues: the acquisition of argument structure, and the acquisition of derivational morphology. As

suggested in previous studies such as Moor (1993), Hirakawa (1995), and others, the findings of her studies confirmed that transitive errors with the transitive and intransitive nonalternating classes constantly emerged among learners regardless of their mother tongue. Her claim is that it is UG that is involved in the acquisition of argument structure, because the learners whose L1s have a similar system to L2 in the argument structure of the target constructions simply transferred their L1s, these errors should not have occurred. With respect to the acquisition of derivational morphology, Montrul suggests that L1 influence plays an important role at the morphological level, because the findings confirmed that their errors with the morphology were obviously traced back to the learners' L1.

Synthesizing all the results, Montrul gives an account of how the argument structure and the derivational morphology are acquired, which assumes the interaction of UG and L1 knowledge. She assumes that learners posit a “default transitive template” as an initial hypothesis at the argument-structure level, while the L1 influence has an effect at the morphological level. The “default transitive template” is illustrated in (266):



(Montrul 2000:244)

Montrul (1997, 2000) explains, “...children fall back on a default transitive template when they know the broad meaning of a given verb but have not yet learned the specific contents of the template that determine which verbs are only transitive, which ones are only intransitive, and which ones alternate” (Montrul 2000, 244).

Thus, the UG-L1 interaction occurs in a discrete manner, and each of them operates at different levels of linguistic structure to constrain interlanguage grammar.

5.3 Summary

In this section, some L2 studies on the acquisition of the unaccusative/unergative distinction and the transitive/inchoative alternation have been reviewed. These studies all show that the acquisition of this phenomenon is problematic for L2 learners, because L2 learners have not only to discover the semantic components that distinguish between the unaccusative/unergative distinction and the transitive/inchoative alternation, but also learn the specific morphosyntax, which is peculiar to the target language.

The study that initially gave an inspiration to other studies was Zobl (1989), which proposed that the occurrence of the incorrect passive morphology 'be'+*en* in L2 production data can be linked with the fact that learners are aware of the distinction between unaccusatives and unergatives, which supports the Unaccusative Hypothesis. Zobl's proposal is supported by Yip (1995) and Balcom (1997), who report on their experimental studies using elicited production, grammaticality judgment tests and so on. Overall, the data from the cloze test and the grammaticality judgment tests in Balcom (1997) support Zobl's (1989) claim. However, incorrect causativisation of unaccusatives was observed in Balcom's L2 data, which runs counter to Zobl's discussion. Yip's (1995) data also revealed that the learners extended the passive rule to unaccusatives. Yip's explanation for this type of error is that unaccusatives are derived from transitives. This is different from that of Zobl (1989) who suggests extended use of an overt marker of syntactic movement. Oshita (1997) also denies the extended use of causativisation as a plausible account, and supports the assumption that passivisation occurs because learners need to use the overt marker of NP movement, based on the fact that there is not much evidence reported on causativised unaccusatives or passive unaccusatives with agentive *by* phrase (ex.**The accident was happened to collect the insurance*; Balcom 1997:8). Associating the realisation and disappearance of the incorrect passive unaccusatives with a specific developmental path, Oshita (1997) proposes the Unaccusative Trap Hypothesis (UTH), which consists of three different stages: the first stage where learners cannot make a distinction between unaccusatives and unergatives and assign an external argument to both classes of verbs; the second stage where learners produce incorrect forms, because they wrongly assume that unaccusatives should be marked by overt morphosyntax; and the final stage where learners are supposed to acquire nativelike knowledge, but Oshita (1998) assumes that learners are hardly reach the final stage.

A similar proposal is also made by Yuan (1999). Based on the data on the acquisition of L2 Chinese by English-speaking learners, he assumes a developmental path for the acquisition of the unaccusative/unergative distinction associated with the postverbal indefinite NP structure. Parallel to Oshita's Unaccusative Trap Hypothesis, Yuan (1999) posits three different stages: the first stage where learners set their target grammar just to the basic Chinese word order S-VP, the second stage where more exposure to the target language gradually makes learners aware that the post-verbal NP is possible, and they start producing the postverbal NP structure regardless of the verb type, and the final stage where learners correct their wrong assumption and start to apply the postverbal indefinite NP form only to unaccusatives. However, the data from his experimental research reveal that the advanced learners who were supposed to be at the final stage still showed indeterminacy in their judgments about unaccusative verbs, which seems to stem from the optionality of the syntactic manifestation for unaccusativity in Chinese. As the findings from the preceding studies suggest, opaque and ambiguous evidence in Chinese unaccusativity may bring about more difficulty in the acquisition of the unaccusative/unergative distinction. Juffs (1996), who conducted a reverse study to Yuan's (1999), reported a similar difficulty with English unaccusativity holds, that is, unaccusative verbs are difficult for Chinese learners to acquire because they lack an overt morphological marker. Hirakawa (2000) is the first study made in L2 Japanese, which confirms that the Japanese language shares similar problems of ambiguity and opaqueness in the syntactic manifestation of unaccusativity.

This is the second study in Japanese following Hirakawa (2000). Along with replicating Hirakawa's study regarding properties such as *takusan* construction, the contributions of our study to the ongoing L2 studies reviewed above include the challenge of applying the Split Intransitivity Hierarchy to a non-Indo European language; the study of transitivity alternation using Japanese native and Sino-Japanese verbs; and others. The report of our experimental studies follows.

CHAPTER 6

THE EXPERIMENTAL STUDY

6.0 Introduction

In this chapter, we report the results of three main studies which have been carried out in the period December 1999 to January 2001. The general aim of the entire work was to explore the influence of lexical semantic features on the acquisition of the syntax-semantics interface in L2 Japanese. The main focus of the research is twofold—monadic verbs and dyadic verbs. As for monadic verbs, the main issue to be addressed is whether the Split Intransitivity Hierarchy (see section 2.2.3.1.2) is followed by learners of Japanese in the same way as it is for learners of Romance languages. The Split Intransitivity Hierarchy was established based exclusively on data from European languages. What is to be investigated is whether the predictions of the Split Intransitivity Hierarchy are equally applicable to non-European languages such as Japanese.

With respect to the dyadic verbs on the other hand, our main interest was whether the difference in the features involving the intransitive/transitive alternation would affect L2 acquisition. These features include not only the mapping between the lexicon and syntax, but also the manifestation of a morphological marker relating to the intransitive/transitive alternation.

The outline of each study is as follows. Experiment I was carried out in order to explore the issues relating the monadic and dyadic verbs. The constructions to be tested were “Quantifier Floating (QF)” for monadic verbs, and Japanese native verbs, Sino-Japanese complex predicates, and psych verbs for dyadic verbs. In addition, the resultative construction and Case Drop were investigated in the preceding pilot tests. Grammaticality judgment tests were used to investigate all the constructions.

Study II was carried out to investigate the same issues with different constructions and different methods. The constructions used in Experiment II were: the *takusan* construction in a picture-cued task for monadic verbs, the *kake* construction for monadic verbs, Sino-Japanese complex predicates and psych verbs for dyadic verbs. Grammaticality judgment tests were used for Experiment II as in Experiment I.

Finally, Experiment III was conducted to examine issues relating exclusively to monadic verbs with the *takusan* and *kake* constructions. The preference test method was employed, since both constructions exhibit two different meanings depending on the verb which is embedded in the construction, and the aim was to establish the learners' response concerning the choice between the two different readings. This chapter consists of the report on two pilot studies and three experiments. Prior to the main study, we shall start to examine the results of the pilot studies.

6.1 Questions to be addressed

The aim of the two pilot studies is to explore the influence of lexical-semantic features on the acquisition of split intransitivity in L2 Japanese. The questions to be addressed are as follows:

1. Will L2 learners of Japanese display a different sensitivity to the unaccusative-unergative distinction depending on the position of monadic verbs along the Split Intransitivity Hierarchy?
2. Will L2 learners of Japanese exhibit more determinate intuitions on unergative syntactic behaviour with verbs denoting non-motional process and less determinate intuitions with verbs denoting involuntary processes? Will they display more determinate intuitions on unaccusative syntactic behaviour with verbs denoting change of location and less determinate intuitions with stative verbs?

6.2 Hypotheses

Assuming that the prediction of the Split Intransitivity Hierarchy will also apply to learners of Japanese as shown by the learners of Italian or French in Sorace (1993, 1995, 1996), the following hypotheses are formulated:

1. Learners would show a stronger preference for grammatical sentences over ungrammatical sentences with core unergative verbs, and a weaker preference with peripheral unergative verbs
2. Learners would be better able to recognise the grammaticality of optional constructions with core unaccusative verbs than with peripheral unaccusative verbs.

6.3 Pilot studies

The two pilot tests were carried out prior to the main study. Two different techniques for the elicitation of acceptability judgments and different types of diagnostic tests were employed in each study in order to find out which might be preferable for the main study.

6.3.1 Participants

The participants of Pilot 1 were 13 adult Japanese native speakers, who were studying at the University of Edinburgh. They ranged in age between 20 and 27. For Pilot 2, a total of 12 participants took part. They were also adult Japanese native speakers studying at the University of Edinburgh. Their ages were between 22 and 34.

6.3.2 Materials

A total of 115 sentences were presented in Pilot 1, consisting of 78 sentences concerned with Quantifier Floating (QF), only 39 sentences with resultatives. Pilot 2 presented 156 sentences in total, consisting of 78 sentences with QF and 78 sentences with Case-Drop (CD). Three verbs from each verb type on the Split Intransitivity Hierarchy were employed. These verbs are shown in Table 6-1.

Table 6-1 List of verbs in the pilot studies¹²

<Unergative>	
Controlled non-motional process:	<i>utau</i> 'sing', <i>asobu</i> 'play', <i>matu</i> 'wait'
Controlled motional process:	<i>oyogu</i> 'swim', <i>aruku</i> 'walk', <i>hasiru</i> 'run'
Uncontrolled process-bodily function:	<i>haku</i> 'vomit', <i>sekikomu</i> 'cough', <i>asebamu</i> 'sweat'
Uncontrolled process-involuntary reaction:	<i>hurueru</i> 'shiver', <i>yureru</i> 'tremble', <i>guratuku</i> 'waver'
Uncontrolled process-emission:	<i>hikaru</i> 'flash', <i>kagayaku</i> 'shine', <i>niou</i> 'smell'
<Unaccusative>	
Change of location:	<i>tuku</i> 'arrive', <i>kuru</i> 'come', <i>saru</i> 'leave'
Change of condition-directed motion:	<i>noboru</i> 'ascend', <i>susumu</i> 'advance', <i>agaru</i> 'rise'
Change of condition-change of state:	<i>kusaru</i> 'rot', <i>kutiru</i> 'decay', <i>sioreru</i> 'wilt'
Change of condition-appearance:	<i>arawareru</i> 'appear', <i>okoru</i> 'happen', <i>syojiru</i> 'arise'
Condition of pre-existing condition:	<i>todomaru</i> 'stay', <i>tuduku</i> 'continue', <i>nokoru</i> 'remain'
Existence of a condition-concrete states:	<i>aru</i> 'be', <i>iru</i> 'need', <i>sonzai-suru</i> 'exist'
Existence of condition-simple position:	<i>yokotawaru</i> 'lie', <i>motareru</i> 'lean', <i>syagamu</i> 'crouch'
Existence of condition-abstract/mental state:	<i>yorokobu</i> 'please', <i>maniau</i> 'suffice'

¹² The category of Existence of condition-abstract or mental state includes only two verbs because one of the stimuli was repeated.

6.3.2.1 Quantifier Floating

Each sentence type had two versions – minimal pairs such as the sentence with QF [+QF] and that without QF [-QF] or with CD [+CD] and without CD [-CD]. Recall that unaccusative verbs are allowed to have the quantifier floating, so either [+QF] and [-QF] sentence is grammatical with unaccusative verb, while QF is not allowed for unergative verb; [+QF] sentence is not grammatical. The examples are as follows:

(267) Unergative

- a. Syoonen-ga sannin umi-de oyoi-da
boy-NOM 3CL sea-in swim-PAST
“Three boys swam in the sea.”
- b. *Syoonen-ga umi-de sannin oyoi-da
boy-NOM sea-in 3CL swim-PAST
“Three boys swam in the sea.”

(268) Unaccusative

- a. Kyaku-ga hutari kaizyo-kara sat-ta
guest-NOM 2CL event hall-from leave-PAST
“Two guests left the event hall.”
- b. Kyaku-ga kaizyo-kara hutari sat-ta
guest-NOM event hall-from 2CL leave-PAST
“Two guests left the event hall.”

6.3.2.2 Case Drop

The Case Drop (CD) construction allows optimality with unaccusative verbs, but not with unergative verbs (Kageyama 1993). CD is widely recognised as a phenomenon likely to occur in informal speech, but as this construction was supposed to be tested by the technique of Magnitude Estimation (ME), where each test sentence is presented by Overhead Projector (OHP) and read aloud with a cassette tape recorder. It was decided to include them in Pilot 2. Examples of test sentences with and without CD are in (269) and (270).

(269) **Unergative**

- a. [Kodomo-ga eki-ni aruit-teita] no-o mita?
child-NOM station-to walk-be NOML-ACC see-PAST
“Did you see the child walking to the station?”
- b. *[Kodomo- ϕ eki-ni aruit-teita] no-o mita?
child - NOM station-to walk-be NOML-ACC see-PAST
“Did you see the child walking to the station?”

(270) **Unaccusative**

- a. [Kyaku-ga ryokan-ni tui-ta] no-o sit-teiru?
guest -NOM inn-at arrive-PAST NOML-ACC know-be
“Do you know that the guest arrived at the inn?”
- b. [Kyaku- ϕ ryokan-ni tui-ta] no-o sit-teiru?
guest -NOM inn-at arrive-PAST NOML-ACC know-be
“Do you know that the guest arrived at the inn?”

6.3.2.3 Resultative Construction

Recall that the resultative phrase only modifies the internal argument, which means unergative verbs which do not have any internal argument are not compatible with the construction. In addition, due to the constraints which the resultative phrase lays (see section 3.1.2), only a subset of unaccusative verbs is allowed to occur with the construction.

A total of 39 sentences with resultative phrases were presented, consisting of 15 resultative sentences with unergative verbs which were all unacceptable and 24 resultative sentences with unaccusative verbs which were partially acceptable. The examples of the test sentences are as follows:

(271) **Unergative**

- a. * Kodomo-ga kutakuta-ni ason-da.
child- NOM tired-DAT play-PAST
“The children played tired”

(272) **Unaccusative**

- a. Hasi - ga boroboro-ni kuti-ta
 bridge-NOM pieces-into decay-PAST
 “The bridge decayed into pieces”
- b. * Kyaku-ga kutakuta-ni tui - ta
 guest-NOM tired-DAT arrive-PAST
 “The guest arrived tired”

6.3.3. Methods

In this section, two main elicitation techniques will be examined for advantages and disadvantages: absolute and relative judgments. The issue to be addressed here is which technique would be more adaptable to the nature of linguistic intuition and measure what is purported to be measured with more validity.

6.3.4. Absolute versus relative judgments

Absolute judgments require of informants “rating” responses, which gets them to assign items into categories on a predetermined scale, for example, a dichotomy between correct/incorrect or a scale with some points are categorized in this type. Relative judgments on the other hand require “ranking” responses, which ask participants to put items in order of acceptability comparing one another. Ordinal scales, interval scales or Magnitude Estimation are involved with this type of judgment.

Sorace (1996:396) points out that absolute judgments have some shortcomings from the perspective of adaptability to the nature of linguistic intuition, which are summarised in the following two points:

- (a) Informants’ judgments are compressed into a limited number of options by category scales, which cause them to place somewhat similar sentences into the same category.
- (b) Absolute judgments are insensitive to the nature of internalised competence, because they cannot capture the indeterminacy of NL and IL grammar.

As one of the solutions for the first problem, scales with more than two options are

sometimes employed. However, Sorace points out that this may cause another problem, which is the difficulty in interpreting the intermediate points that the informants may choose. This is likely to occur, especially when these intermediate points are not defined clearly.

The second problem closely relates to the first one, in the sense that with absolute judgements informants are not given appropriate ways to express their judgments. In other words, they are forced to choose one among existing options no matter to what extent they are sure of their response. As a result, some responses are actually derived not from judgments but random choices.

On the other hand, as to relative judgments, it is claimed that informants can give more bold responses than with absolute judgments (Nunnally 1967), because the ranking responses required in relative judgments better conform to the nature of human judgments. Sorace (1996) also makes the following three points for the main advantages which ranking measurements hold: (a) fewer constraints on the range of judgments, (b) greater psychometric plausibility, (c) suitability for capturing indeterminacy.

In order to validate their discussion and to make a final decision on which technique to employ for our main study, it was decided that both types of techniques were going to be employed for each of Pilot 1 and Pilot 2. The measurement used for Pilot 1 was a 4-point scale, while that for Pilot 2 was Magnitude Estimation (ME). The brief description of each technique is summarized as follows:

A. 4-point scale

It was decided that a 4-point scale would be used for Pilot 1. The reason why a scale without a middle point was chosen was so as not to allow the informants to choose the intermediate category in the sense of “not sure”, “in between”, but make them choose between “more acceptable” and “more unacceptable”. It has been reported that informants tend to choose the intermediate category to avoid making judgments about which they are uncertain. Sorace (1996) claims that there is always the risk that *acceptability* is taken for *certainty*. Among these categories, especially the one for expressing uncertainty in particular (“not sure”, “don’t know”) may trigger confusion among informants, and make them misunderstand that they are being asked to judge

certainty but not acceptability.

B. Magnitude Estimation (ME)

Magnitude Estimation (ME) was employed as a technique for the elicitation of acceptability judgments, a method originally used in psychophysics and recently adopted for the measurement of linguistic acceptability (Sorace 1996; Bard, Robertson and Sorace 1996). Sorace (1996) claims that one of the advantages of ME is that it allows informants to express their own judgments with numbers, without compressing them into a predetermined category scale. ME starts with the presentation of the first sentence, where informants are asked to assign any number to it. After that, they are expected to assign numbers to successive sentences in proportion to the perceived degree of acceptability to the first sentence. Informants are allowed to use any positive number including decimals and fractions.

Higher numbers correspond to more acceptable sentences, while lower numbers correspond to less acceptable sentences. Compared with conventional category rating scales, ME yields data on an interval scale, and gives subjects the freedom to set up their own range and categories of judgments, thus enabling them to make finer distinctions in their judgments. Bard, Robertson, and Sorace (1994,1996) carried out research on NS competence employing ME. They report that the results were consistent inter- and intra-subjects, which can be interpreted as saying that ME is a valid tool to measure linguistic competence.

6.3.5 Procedures

A. 4-point scale

The participants received a questionnaire which had 117 test sentences and the answer sheet which consisted of 4-point scales. They were asked to make judgments for each sentence in a reasonable time and told not to go back to the previous item during the test.

B. Magnitude Estimation

First the written instructions (in English for the learners and in Japanese for the controls) were distributed to the participants, who had a short practice session where they were asked to make judgments on the line length (see Bard, Robertson and Sorace

1996 for details) so as to get familiar with the concept of proportionality. They were encouraged to ask clarification questions before starting the experiment.

Then the main test followed the practice session. The 170 sentences including 14 distracters were presented in isolation one by one on an overhead projector screen. They were also recorded on tape so that the informants could listen to them as they appear on the screen. There was an interval of seven seconds between each sentence.

6.3.6 Analysis

The data were transformed into log scores and all mathematical and statistical operations were performed based on them. First, the mean scores of acceptability judgments were calculated, which was followed by a three-way repeated measures ANOVA performed on unaccusative sentences and unergative sentences separately. The variables for each ANOVA consisted of verb type, construction, and proficiency group. Further ANOVAs were conducted on the results for each group, on both unergative and unaccusative verbs. If the ANOVA yielded a significant effect or interaction, post-hoc pairwise comparison tests were operated in order to specify the location of the difference. Pairwise comparison tests were performed both within categories and across categories for each group.

6.3.7 Results

6.3.7.1 The results and insight gained from Pilot 1

The results of QF were quite close to our prediction. That is, the learners were more sure and preferred to choose +2 for grammatical sentences with core verbs, while less confident and tending to chose +1 for grammatical sentences with peripheral verbs. On the other hand, the difference was not so significant between the scales -1 and -2 for ungrammatical sentences with unergative verbs regardless of their position on the hierarchies.

The learners' performance on the resultative construction was to some extent counter to our prediction. It didn't manifest any consistent pattern apart from the fact that many subjects correctly rejected the resultative construction for unergative verbs. The judgments varied between acceptable and unacceptable within the class of unaccusative verbs. In addition, the results did not show any gradient effect among

verb classes. This is assumed to stem from the constraints of the resultative construction. As discussed in section 3.1.2, the resultative construction in English has been known to apply to a subset of unaccusative verbs, because the verb's compatibility with the resultative depends on whether the result specified by the resultative phrase is part of the verb's meaning (Tortora 1998). The results indicate that the same conflicts apply to the resultative construction in Japanese, and it would thus not be a suitable diagnostic test to be employed for the main study.

A few problems remained with regard to the technique employed for the elicitation of acceptability judgments, which one closely related to the shortcomings of absolute judgments pointed out by Sorace (1996). The main problem is that informants may not be able to express genuine indeterminacy, because they are forced to choose either grammatical or "ungrammatical" no matter how certain of their judgments they are. Sorace (1996:396) points this out and says, "Informants' judgments are compressed into a limited number of options by category scales."

6.3.7.2 The results and insight gained from Pilot 2

Pilot 2 tested on the Quantifier Floating (QF) and the Case Drop (CD) with the technique of Magnitude Estimation (ME). The results of the ANOVA will not be reported in detail here, but the overall finding for each diagnostic test will be summarized in the section.

6.3.7.2.1. Quantifier Floating (QF)

The results for unergatives confirm that the native controls clearly distinguish between [-QF] sentences and [+QF] sentences. Recall that the [+QF] construction is ungrammatical with unergative verbs. The controls reject QF with all verb types, but not in the same strength. Their rejection is much stronger with verbs of non-motional process and motional process than the other types, while it is much less with verbs of emission. This is parallel to the prediction by the Split Intransitivity Hierarchy.

On the other hand, the results of unaccusatives were rather difficult to generalize. They show an even pattern in their judgments for each verb type. They accept both [+QF] sentences and [-QF] sentences almost in the same way with verbs of appearance and verbs of pre-existing condition, while they show a clear preference for [-QF]

sentences with verbs of change and verbs of state, which is contrary to our prediction, for it was assumed that they would accept [+QF] sentences as much as [-QF] with the core unaccusative verbs.

On the whole, the native controls show a preference for [-QF] sentences with all verb types except for verbs of appearance even though they are less reluctant to accept [+QF] sentences with unaccusative verbs than with unergatives. What is striking is that they differentiate between [-QF] sentences and [+QF] sentences not only with unergatives but also with unaccusatives, despite the fact that both constructions are grammatical.

6.3.7.2.2. Case Drop (CD)

Their performance on the CD test did not support our assumptions. In the theoretical discussion, CD is supposed to be more acceptable with unaccusative verbs than unergative verbs. However, the results shows that the native controls did not really differentiate between CD with unergatives and CD with unaccusatives. The results revealed that they were basically not willing to accept the [+CD] construction with any verb type.

However, a slight gradient effect is visible with unergative verbs, but not in unaccusative verbs. The Japanese native speakers accept [+CD] sentences with verbs of emission more than with the other unergative verb type.

6.4 Experiment I

6.4.1. Introduction

The results from the two pilot studies carried out prior to the main study led us to the following methodological decisions:

1. Magnitude Estimation would be employed for the main study 1.
2. Only Quantifier Floating would be tested.

6.4.2. Questions to be addressed

1. Will L2 learners of Japanese display different sensitivity to the

unaccusative-unergative distinction depending on the position of monadic verbs along the Split Intransitivity Hierarchy?

2. Will L2 learners of Japanese exhibit more determinate intuitions on unergative syntactic behaviour with verbs denoting non-motional process and less determinate intuitions with verbs denoting involuntary processes? Will they display more determinate intuitions on unaccusative syntactic behaviour with verbs denoting change of location and less determinate intuitions with stative verbs?
3. Will L2 learners of Japanese experience more difficulty in making a distinction between alternating and non-alternating verbs when they lack an overt morphological feature like in English?
4. Will L2 learners of Japanese transfer their L1 knowledge of the intransitive/transitive alternation to Japanese when they cannot get any information about the verb's properties from overt morphological forms?
5. Will L2 learners of Japanese show a preference for the passive construction over the inchoative construction with alternating verbs?
6. Will learners of Japanese experience any difficulty in judgments for Subject-Experiencer (SE) verbs? Also, will they be aware of the overt causative morphology in Japanese psychological verbs?
7. Will English speaking learners accept Object-Experiencer (OE) verbs more readily than the native control group does as suggested in White (1998,1999)?

6.4.3 Hypotheses

Based on the Split Intransitivity Hierarchy, the following hypotheses are formulated for monadic and dyadic verbs.

1. Learners would show a stronger preference for grammatical sentences over ungrammatical sentences with core unergative verbs, and a weaker preference with peripheral unergative verbs.
2. Learners would be better able to recognize the grammaticality of optional constructions with core unaccusative verbs than with peripheral unaccusative verbs.
3. Even if the learners' L1 does not have overt morphology which distinguishes between intransitive and transitive verbs, the L2 morphology would be of some help in learning the difference between them. Thus the subset of verbs in Japanese which are morphologically identical in their inchoative and causative

forms may also be of difficulty for English speaking learners of Japanese.

4. If Montrul's view of transfer is plausible, L1 is not supposed to have a role at the argument level. Thus, English-speaking learners of Japanese would not transfer their L1 knowledge of the causative/inchoative alternation to Japanese.
5. Learners would find Subject-Experiencer (SE) verbs in Japanese difficult, because there is a difference in correspondence of OE and SE verbs between Japanese and English – several SE verbs in Japanese correspond to OE verbs in English.

6.4.4 Participants

There were 89 participants taking part in the study: a group of 29 English-speaking adults who were learning Japanese, having just begun a 9 month Japanese course at one institution in Osaka (post-beginners); a group of 31 native English-speaking adults who had almost completed a 9 month Japanese course offered at three different institutions in Tokyo (intermediates)"; and 36 Japanese native speakers who study at the University of Kumamoto (controls). In this study, the post-beginners are labeled Group 1, the intermediates are Group 2, and the controls are Group 3. The study was carried out in different locations because of (a) constraints on the availability of adult English-speaking learners of Japanese who share a similar background concerning their prior experience with Japanese; and (b) difficulty in obtaining collaboration with institutions. According to background information given by the participants', their ages at the time of testing ranged between 20 and 27 years, and all of them had been studying Japanese in a school setting for at least two years, although they had little exposure to Japanese outside the classroom setting before they came to study in Japan.

Prior to the experiment, all the subjects except for the Japanese native control group took a vocabulary test, whose purpose was to determine their familiarity with the lexical items in the task, and a cloze test, designed to ascertain that the proficiency levels of the two learner groups were substantially different. The cloze test involved a short passage in Japanese with every ninth word deleted, leaving a total of six blanks. Multiple choices were provided for each blank. The subjects were asked to select the appropriate word from the choices provided. Time constraints limited the vocabulary test to only 10 of the verbs which were used as experimental items. Subjects were asked to match each verb with its meaning, given in English. The results of these tests are presented in Table 6-2.

Table 6- 2: Results of the cloze test and vocabulary test

Group	cloze test		vocabulary test	
	Mean	SD	Mean	SD
group 1(N=29)	2.62	0.78	8.69	2.27
group 2 (N=31)	3.26	0.86	9.23	1.78

The Table shows there is a significant difference between the post-beginners and the intermediates in the cloze test ($t = 3.02$, $p < .004$), which confirms that these groups differ in their proficiency. There was no significant difference between the two groups in regard to the vocabulary test ($t = 1.02$, $p < .31$, ns), and this shows the familiarity of both groups with the lexical items chosen for the task.

6.4.5 Test instrument

The technique used for Study 1 was Magnitude Estimation, which is a type of measurement originally used for psychometric experiments (measuring brightness, sound, etc.) and recently applied to the technique for linguistic research.

Without giving a predetermined category scale, the technique asks informants to assign numbers to successive sentences in proportion to the value of the first sentence. They are expected to use any positive number including decimals and fractions. Higher numbers correspond to more acceptable sentences, while lower numbers correspond to less acceptable sentences. Compared with conventional category rating scales, ME yield data on an interval scale, and gives subjects the freedom to set up their own range and categories of judgments, thus enabling them to make finer distinctions in their judgments (refer to 6.3.3 for details).

6.4.6 Test items

a. Monadic verbs

In the ME test, 136 sentences were presented in total, consisting of 30 items for unergative verbs 46 items for unaccusative verbs and 60 items for dyadic verb. Since the hypotheses of this study are associated with the unaccusative/unergative hierarchies as its basis, three verbs were selected from each verb type to formulate the sentence.

The verbs for monadic verbs are the same as those used in Pilot 1 and 2 (see Table 6-1).

b.Dyadic verbs

The breakdown of the 60 sentences with dyadic verbs is: 30 sentences with Japanese native verbs, 20 sentences with Sino-Japanese verbs, and 10 sentences with Psychological verbs. Both the Japanese native verb group and Sino-Japanese verb group consist of two different verb types: alternating verbs and non-alternating verbs. Of these the alternating Japanese native verbs are further classified into two groups: those which alternate both in English and Japanese, and those which alternate only in Japanese. All the dyadic verbs used in Study 1 are summarised in the following table.

Table 6-3: Verbs used in the ME task

Verb group	type	intransitive	transitive
Japanese native verbs	alternating	<i>uturu</i> 'move'	<i>utusu</i> 'move'
		<i>kawaru</i> 'change'	<i>kaeru</i> 'change'
		<i>hazimaru</i> 'start'	<i>hazimeru</i> 'start'
		<i>tomaru</i> 'stop'	<i>tomeru</i> 'stop'
		<i>tuduku</i> 'continue'	<i>tudukeru</i> 'continue'
	alternating only in Japanese	<i>kimaru</i> '*decide (int)'	<i>kimeru</i> 'decide'
		<i>mitukaru</i> '*find (int)'	<i>mitukeru</i> 'find'
		<i>umaru</i> '*bury(int)'	<i>umeru</i> 'bury'
		<i>uwaru</i> '*plant (int)'	<i>ueru</i> 'plant'
		<i>tukamaru</i> '*catch (int)'	<i>tukamaeru</i> 'catch'
	non-alternating	* <i>kurabaru</i> 'compare'	<i>kuraberu</i> 'compare'
		* <i>hakobaru</i> 'carry'	<i>hakobu</i> 'carry'
		* <i>erabadu</i> 'choose'	<i>erabu</i> 'choose'
		* <i>tukawaru</i> 'use'	<i>tukau</i> 'use'
		* <i>sirabaru</i> 'investigate'	<i>siraberu</i> 'investigate'
Sino-Japanese verbs	alternating	<i>ido-suru</i> 'move'	<i>ido-suru</i> 'move'
		<i>henko-suru</i> 'change'	<i>henko-suru</i> 'change'
		<i>kaisi-suru</i> 'start'	<i>kaisi-suru</i> 'start'
		<i>teisi-suru</i> 'stop'	<i>teisi-suru</i> 'stop'
		<i>keizoku-suru</i> 'continue'	<i>keizoku-suru</i> 'continue'
	non-alternating	* <i>hikaku-suru</i> '*compare(int)'	<i>hikaku-suru</i> 'compare'
		* <i>unso-suru</i> '*carry (int)'	<i>unso-suru</i> 'carry'
		* <i>sensyutu-suru</i> '*choose(int)'	<i>sensyutu-suru</i> 'choose'
		* <i>siyo-suru</i> '*use (int)'	<i>siyo-suru</i> 'use'
		* <i>tyosa-suru</i> '*investigate(int)'	<i>tyosa-suru</i> 'investigate'
Psychological verbs		<i>nayamu</i> 'be annoyed'	—
		<i>otikommu</i> 'be disappointed'	—
		<i>obieru</i> 'be frightened'	—
		<i>kizutuku</i> 'be hurt'	—
		<i>mayou</i> 'be puzzled'	—

As Table 6-3 shows, there were five nonce Japanese native verbs, which were made up as a inchoative counterpart for certain transitive verbs, for example, *kurabaru* “compare(*int*)”, derived from *kuraberu* “compare”, and *hakobaru* “carry (*int*)”, derived from *hakobu* “carry”. In addition, pseudo-inchoative counterparts of Sino-Japanese transitive verbs were also included. Since these verbs do not have an inchoative counterpart, they are never allowed to be used in the inchoative construction and assigned Nominative case (*ga*).

The intransitive verbs were presented in the inchoative construction, while the transitive verbs were in the passive construction. The reason why the passive construction rather than the causative construction was employed was to see whether learners are able to distinguish verb types in terms of their behaviour in different constructions: inchoatives and passives. That is, alternating instances of Japanese native verbs and Sino-Japanese verbs allow both constructions: inchoatives and passives, while non-alternating verbs do not. Furthermore, the question to be answered is, when both constructions are possible, which construction would be more preferred by learners: the inchoatives, which do not make NP movement with an overt syntactic marker or the passives which mark NP movement with the passive morphosyntax ‘*rare*’ (*be+en*)? Examples for each category are presented as follows:

(273) Japanese native verbs-alternating

- a. Kaigi-ga nagai aida **tudui-ta**
 meeting-NOM long while continue-PAST
 “A meeting continued for a long time”
- b. Kaigi-ga nagai aida **tuduke-rare-ta**
 meeting-NOM long while continue-PASS-PAST
 “A meeting was continued for a long time”

(274) Japanese native verbs-alternating only in Japanese

- a. Kekkonsiki - no hidori-ga **kimat-ta**
 wedding ceremony-GEN date-NOM decide(*int*)-PAST
 “*The date of the wedding ceremony decided ”
- b. Kekkonsiki -no hidori-ga kime-rare-ta
 wedding ceremont-GEN date-NOM decide-PASS-PAST
 “The date of the wedding ceremony was decided”

(275) Sino-Japanese verbs-alternating

- a. Kaigi-ga nagai aida **KEIZOKU-sita**
meeting-NOM long while continue-did
“A meeting continued for a long time”
- b. Kaigi-ga nagai aida **KEIZOKU- sa-re-ta**
meeting-NOM long while continue-*suru*-PASS-PAST
“A meeting was continued for a long time”

(276) Japanese native verbs-nonalternating

- a. *Nimotu-ga hoteru-ni **hakobat-ta**
luggage-NOM hotel-at carry-PAST
“*Some luggage carried to the hotel.”
- b. Nimotu-ga hoteru-ni **hakoba- re- ta**
luggage-NOM hotel-at carry (*int*)-PASS-PAST
“Some luggage was carried to the hotel”

(277) Sino-Japanese verbs-nonalternating

- a. *Nimotu-ga hoteru-ni **UNSO-shita**
luggage-NOM hotel-at carry (*int*)-did
“*Some luggage carried to the hotel”
- b. Nimotu-ga hoteru-ni **UNSO-sa-re-ta**
luggage-NOM hotel-at carry-*suru*-PASS-PAST
“Some luggage was carried to the hotel.”

As shown in (273)-(277), these examples consist of two different types of minimal pairs: inchoatives and passives.

There were also ten sentences with psychological verbs in the test. Five verb items were included: *nayamu* (be troubled), *otikomu* (be disappointed), *obieru* (be frightened), *kizutuku* (be hurt), *mayou* (be puzzled). Each item consists of two construction types as follows:

- (278) a. * Kare-wa yuuzin ni yokisenu henzi de mayot-ta
he-TOP friend by unexpected response at puzzle-PAST
“He was puzzled at the unexpected response by his friend”

- b. Kare-wa yuuzin ni yokisenu henji de mayow-as-are-ta
 he –TOP friend by unexpected response at puzzle-CAUS-PASS-PAST
 “He was puzzled at the unexpected response by his friend”

(278a) is the inchoative construction consisting of Japanese SE verbs, and the *Target Subject Matter of Emotion* (T/SM) (Pesetsky 1995), “*yokisenu henji* (unexpected response)” and Causer, “*yuujin ni* (by his friend)”, which is ungrammatical, because it violates the thematic hierarchy which Pesetsky postulates: Causer>Experiencer>Target/Subject Matter. Recall that θ -grid for SE verbs is described as [Experiencer, Target/Subject Matter], while θ -grid for OE verbs is described as [Causer, Experiencer] (see section 4.3.1.4 for the details).

The English equivalents to the Japanese SE verbs are always presented with the passive forms (ex. *mayou* ‘be puzzled’, *nayamu* ‘be annoyed’, *odoroku* ‘be surprised’), and the English equivalents have no problem with taking *Target Subject Matter of Emotion*. This is also pointed out by Pesetsky (1995:96)— “No verb in English means ‘be pleased’, ‘be sad’, ‘be amused’ or their inchoative counterparts ‘become pleased’, ‘become sad’, ‘become amused’.” Thus, the question to be answered is how learners of Japanese deal with the Japanese SE verbs, for which English does not have any lexical equivalents. More specifically, do learners of Japanese try to fall back on a direct translation of Japanese in English so that they can deduce the argument structure of Japanese psych verbs?

In addition, (278) is a causative passive construction. Recall that Japanese does not really have OE verb. Therefore an SE verb + (*s*)*ase* construction is used to make up for the lack of OE verbs in Japanese (ex. *nayamam-ase-ru* ‘trouble’, *odorok-ase-ru* ‘surprise’, *tanosim-ase-ru* ‘amuse’). What is intended to be investigated with this item is whether learners whose L1 does not have overt causative morphology in psychological verbs are aware of the fact that OE equivalents in Japanese always require use of the periphrastic *sase* construction.

6.4.7 Procedures

Prior to the main test, written instructions (in English for the learners and in Japanese for the controls) were distributed to the participants, who had a short practice session

where they were asked to make judgments on line length (see Bard, Robertson and Sorace 1996 for details), so as to get familiar with the concept of proportionality. They were encouraged to ask questions for clarification before starting the experiment.

The main test followed the practice session. The 136 sentences were presented in isolation one by one on an overhead projector (OHP) screen. They were also recorded on tape so that the informants could listen to them as they appeared on the screen. There was an interval of seven seconds between each sentence.

6.4.8 Analysis

The data were transformed into log scores and all mathematical and statistical operations were conducted based on them. First, the mean scores of the acceptability judgments were calculated, which was followed by a three-way repeated measures ANOVA performed on unaccusative sentences and unergative sentences separately. The variables for each ANOVA consisted of verb type, construction, and proficiency group. Further ANOVAs were conducted on the results for each group, on both unergative and unaccusative verbs. If the ANOVA yielded a significant effect or interaction, post-hoc pairwise comparison tests were operated in order to specify the location of the difference. Pairwise comparison tests were performed both within categories and across categories for each group.

6.4.9. Results of Experiment I

6.4.9.1 Monadic verbs

6.4.9.1.1 Monadic-Unergative verbs

The mean acceptability judgments of the three groups of unergative verbs is presented in Tables 6-4, 6-5, 6-6 and Figures 6-1, 6-2, and 6-3.

Table 6-4. Group 1: Mean acceptability judgments on unergative verbs

	non-motional process	motional process	bodily function	involuntary reaction	emission
NQF	3.25	3.13	3.01	2.97	3.03
QF	3.13	2.78	3.07	3.02	2.94

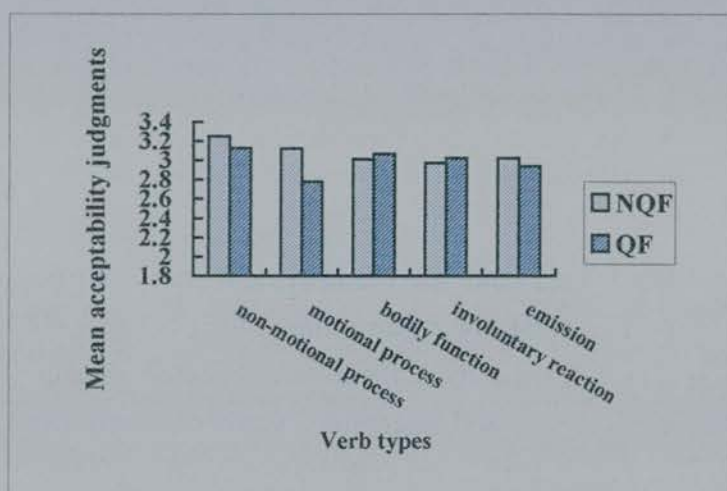


Figure 6-1. Group 1: Mean acceptability judgments on unergative verbs

Table 6-5. Group 2: Mean acceptability judgments on unergative verbs

	non-motional process	motional process	bodily function	involuntary reaction	emission
NQF	2.30	2.23	2.17	2.15	2.05
QF	2.04	1.88	2.08	2.08	2.10

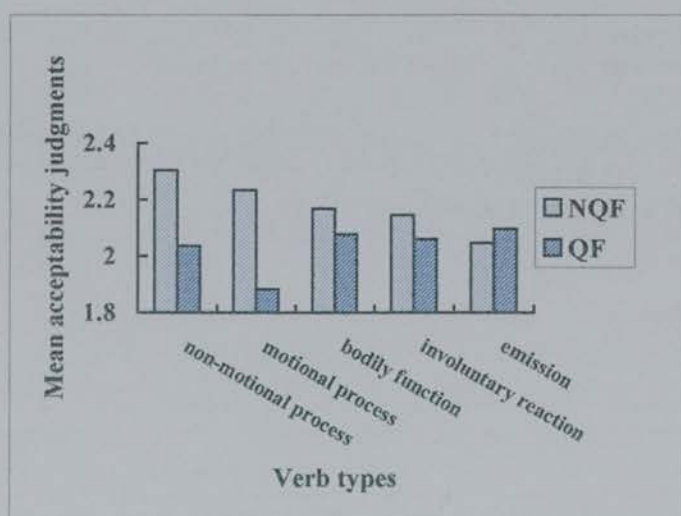


Figure 6-2. Group 2: Mean acceptability judgments on unergative verbs

Table 6-6. Group 3: Mean acceptability judgments on unergative verbs

	non-motional process	motional process	bodily function	involuntary reaction	emission
NQF	3.24	3.03	3.07	2.93	3.27
QF	2.55	2.33	2.69	2.71	2.92

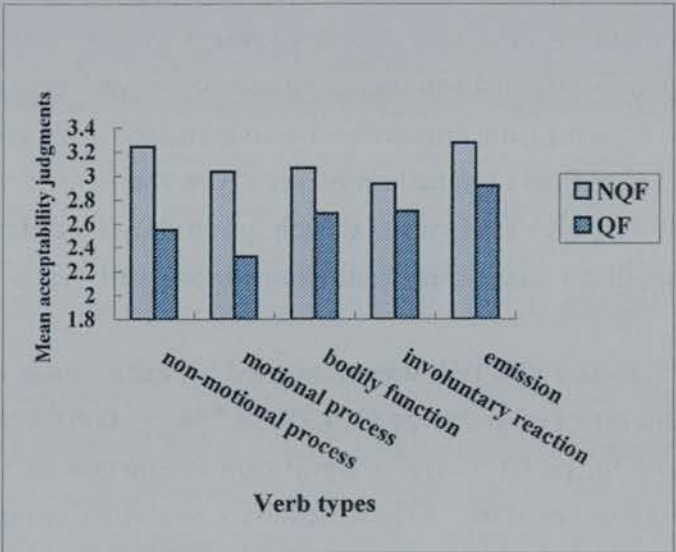


Figure 6-3. Group 3: Mean acceptability judgments on unergative verbs

The graphs indicate that none of the groups were the same in their response. The intermediates (Group 2) and the native controls (Group 3) share some similar pattern of responses, while the post beginners (Group 1) show a totally different tendency in their judgments from the other two groups. One of the striking differences of G1 from the other groups is that they do not really differentiate between sentences with QF [+QF] and without QF [-QF]. They just treat [+QF] and [-QF] almost in the same way except for verbs of motional process, which shows that quite a few of them may not have an idea that [+QF] is ungrammatical for unergatives. Group 1 accepts [+QF] more than [-QF] with verbs of bodily function and involuntarily function, which confirms this assumption as well.

Unlike Group 1, Group 2 showed a clear difference in their judgments between [+QF] and [-QF]. In particular, the difference between the two constructions is remarkable with verbs of non-motional process and motional process. Only verbs of emission show the opposite pattern from the other four types, and [+QF] is accepted more than [-QF].

Group 3 strongly differentiates between [+QF] and [-QF] especially with verbs of non-motional process and motional process, which is parallel to the responses by Group 2. However, Group 3 accepts [+QF] and [-QF] sentences with verbs of emission more readily than the other four verb types, which is a clear difference from the results of Group 2.

The overall ANOVA produces a main effect of verb type ($F(4,86)=7.175$, $p<.0001$), a main effect of group ($F(2,86)=6.101$, $p<.003$), a significant interaction of verb type and group ($F(8,86)=3.860$, $p<.0001$), a significant interaction of construction with group ($F(2,86)=18.553$, $p<.0001$), and a significant interaction of verb type and construction and group ($F(8, 86)=5.507$, $p<.0001$), which confirms that each group shows a different pattern in their judgments, and that they make a clear distinction among verb types.

In order to get a finer picture, a two-way ANOVA was conducted for each group. The ANOVA for Group 1 shows a main effect of verb type ($F(4,28)=3.788$, $p<.006$), a main effect of construction ($F(1,28)=4.520$, $p<.042$), and a significant interaction of verb type and construction ($F(4,28)=2.836$, $p<.028$). These results reveal that Group 1 significantly differentiate among verb types even though the graph (Figure 6-1) does not clearly show the difference. In contrast, construction type barely shows a significant effect ($p<.042$) as predicted by the observation of the graph. Post-hoc pairwise comparison tests within and across the verb types were performed to pin down the location of the significance. Pairwise comparison tests within the verb type yield a significant difference only with verbs of motional process ($p<.001$), which specifies that Group 1 differentiates between [+QF] and [-QF] only with verbs of motional process. However, there are several pairs which show a significant difference across verb types; [+QF] sentences with non-motional process verbs & motional process verbs ($p<.017$), non-motional process verbs & involuntary reaction verbs ($p<.009$), non-motional process verbs & emission verbs ($p<.020$), and motional verbs & involuntary reaction verbs ($p<.048$), [-QF] sentences with non-motional process verbs & motional process verbs ($p<.0001$), non-motional process verbs & emission verbs ($p<.023$), and motional process verbs & bodily function verbs ($p<.008$). Pairwise comparison tests across the verb type reveal that G1 learners are more determinate about the distinction between the core verb and the peripheral verb types (ex. non-motional process verbs & emission verbs), also within the core verb types (ex. non-motional process verbs & motional process verbs), but not among the peripheral verb types (ex. involuntary reaction & emission verbs).

verb types (ex. involuntary reaction & emission verbs).

The ANOVA for Group 2 shows a main effect of construction ($F(1,30)=8.494$, $p<.007$), and a significant interaction of verb type with construction ($F(4,30)=6.951$, $p<.0001$). These results show that Group 2 clearly differentiates between [+QF] and [-QF] within the verb type; however, they hardly differentiate across verb types. Pairwise comparison tests within the verb type indicate a significant difference with non-motional process verbs ($p<.004$) and motional process verbs ($p<.000$). Across the verb types, it shows a significant difference between [+QF] sentences with non-motional process verbs & involuntary reaction verbs ($p<.017$), non-motional process verbs & emission verbs ($p<.001$), motional verbs & emission verbs ($p<.005$); between [-QF] sentences with motional process verbs & bodily function ($p<.016$), motional process verbs & involuntary reaction ($p<.016$), motional process verbs & emission verbs ($p<.008$). Group 2 rejects [+QF] sentences more forcefully with core verbs (ex. non motional process verbs, motional process verbs) than peripheral verbs (involuntary reaction, emission verbs).

The ANOVA for Group 3 shows a main effect of verb type ($F(4,28)=7.019$, $p<.0001$), a main effect of construction ($F(1,28)=15.008$, $p<.001$), and a significant interaction of verb type and construction ($F(4,28)=3.698$, $p<.007$). These results confirm that the native Japanese speakers make a clear distinction in their judgments with both constructions and verb types, which is parallel to our first prediction. Pairwise comparison tests show a significant difference within the verb type with non-motional process verbs ($p<.0001$), motional process verbs ($p<.0001$), bodily function verbs ($p<.017$), emission verbs ($p<.038$). The results confirm that the native Japanese speakers are more determinate with the core verbs (ex. non-motional process verbs, motional process verbs) than the peripheral verbs (ex. bodily function verbs, emission verbs) as we predicted. Across the verb types, the tests yield a significant difference with quite a few pairs; [+QF] sentences with non-motional process verbs & emission verbs ($p<.006$), motional process verbs & bodily function verbs ($p<.000$), motional process verbs & involuntary reaction verbs ($p<.012$), motional process verbs & emission verbs ($p<.0001$), bodily function verbs & emission verbs ($p<.023$), involuntary reaction verbs & emission verbs ($p<.045$), [-QF] sentences with non-motional process verbs & motional process verbs ($p<.005$), non-motional process verbs & involuntary reaction verbs ($p<.007$), bodily function verbs & emission verbs ($p<.006$), involuntary reaction verbs & emission verbs ($p<.009$). These results

confirms that the native speakers clearly differentiate across verb types. In particular, the difference is more significant between the core and peripheral verb types.

6.4.9.1.2 Monadic-Unaccusative verbs-uncombined version

The mean acceptability judgments for the three groups of unaccusative verbs are shown in Tables 6-7, 6-8, 6-9, and Figures 6-4, 6-5, 6-6.

Table 6-7. Group 1: Mean acceptability judgments on unaccusative verbs

	change of location	directed motion	change of state	appearance	pre-existing condition	concrete states	simple position	abstract state
NQF	3.20	3.02	3.12	3.01	3.15	2.97	3.06	2.96
QF	3.11	3.13	3.12	2.97	3.05	3.01	2.99	3.02

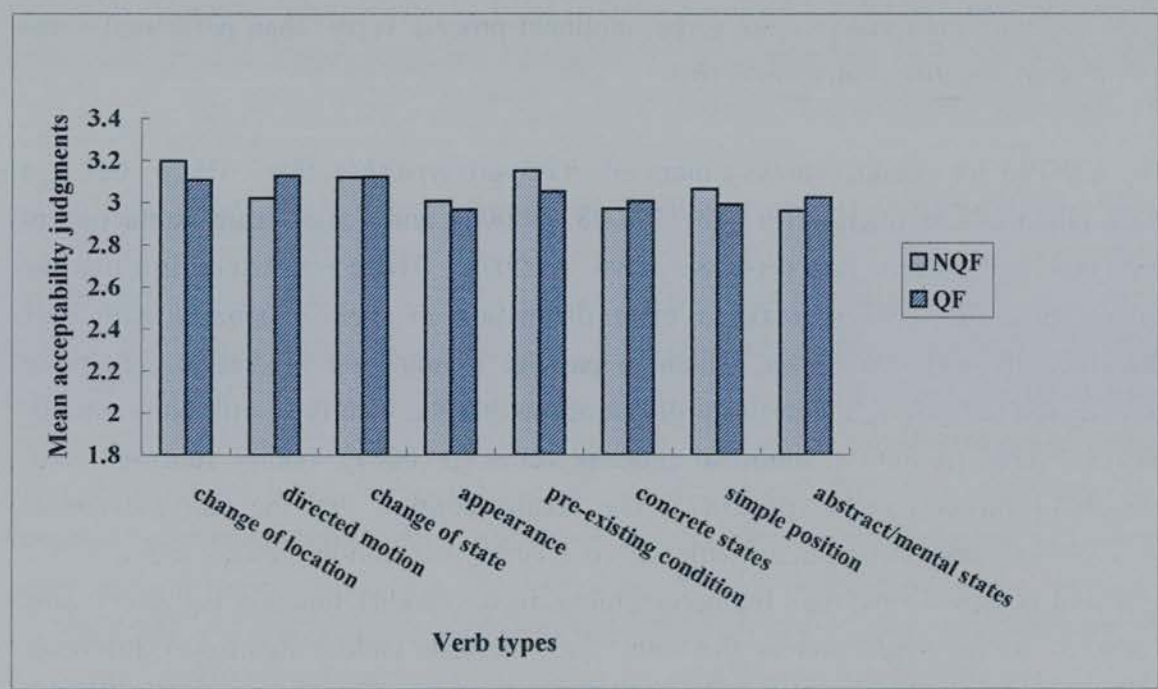


Figure 6-4. Group 1: Mean acceptability judgments on unaccusative verbs

Table 6-8. Group 2: Mean acceptability judgments on unaccusative verbs

	change of location	directed motion	change of state	appearance	pre-existing condition	concrete states	simple position	abstract state
NQF	2.22	2.16	2.19	1.98	2.17	2.17	2.24	2.08
QF	2.05	2.08	2.19	1.99	2.11	2.10	2.01	1.98

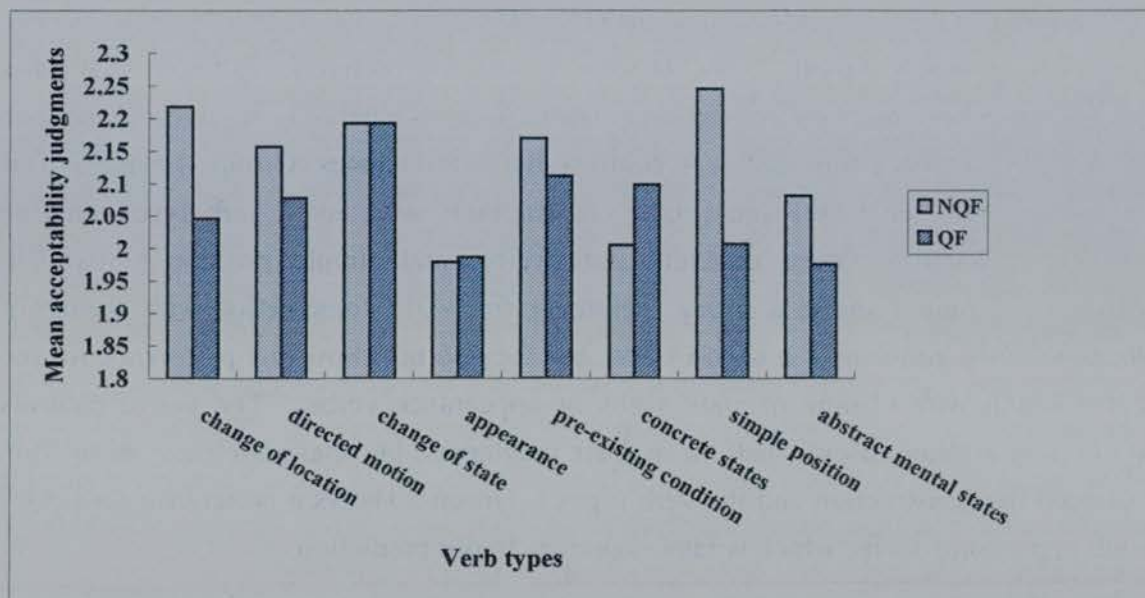


Figure 6-5. Group 2: Mean acceptability judgments on unaccusative verbs

Table 6-9. Group 3: Mean acceptability judgments on unaccusative verbs

	change of location	directed motion	change of state	appearance	pre-existing condition	concrete states	simple position	abstract state
NQF	3.17	3.23	3.33	3.15	3.28	3.16	3.31	2.87
QF	3.11	2.96	3.12	3.17	3.00	3.00	3.13	2.34

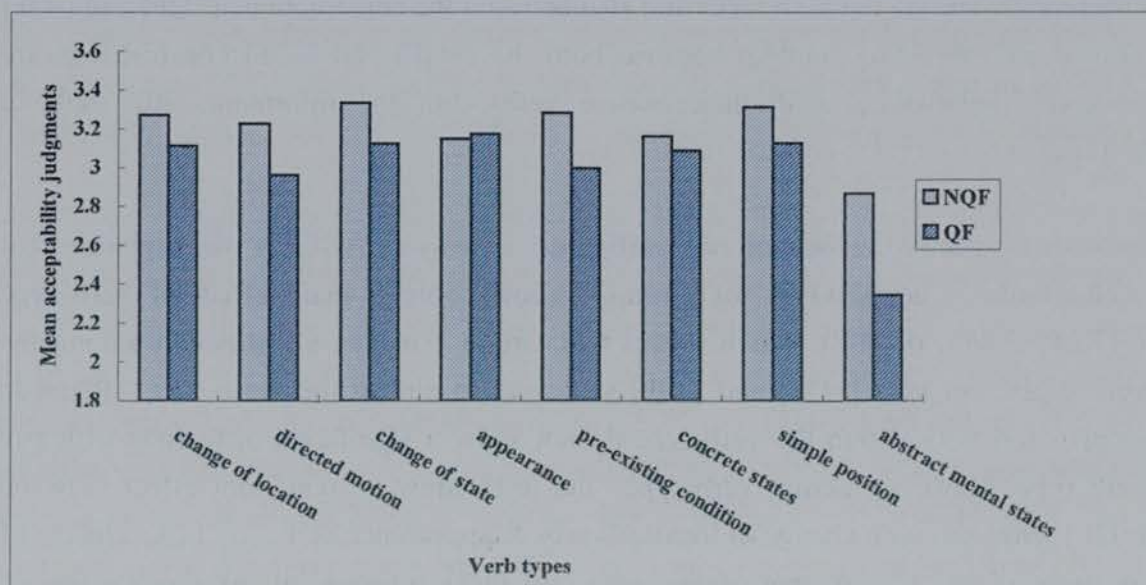


Figure 6-6. Group 3: Mean acceptability judgments on unaccusative verbs

The graphs do not show any similar pattern in the judgments among the three groups. The post-beginners (Group 1) do not show any strong preference between [-QF] and [+QF] sentences except for pre-existing condition verbs where the strongest preference is for [-QF] sentence was seen. In contrast, the intermediates (Group 2) make a clear distinction between [-QF] and [+QF] constructions with some verb types such as change of location verbs, concrete state verbs, and simple position verbs. In particular, Group 2 shows a strong preference for [-QF] construction with change of location verbs and simple position verbs, but they do not show any preference for the construction with change of state verbs or appearance verbs. The native controls (Group 3) display an even pattern in their judgments, but make a clearer distinction between the construction and the verb types. Group 3 shows a preference for [+QF] with appearance verbs, which is rather contrary to our prediction.

The overall ANOVA produces a main effect of verb type ($F(7,86)=5.753$, $p<.0001$), a main effect of group ($F(2,86)=7.979$, $p<.001$), a main effect of construction ($F(1,86)=4.475$, $p<.037$), a significant interaction of verb type and group ($F(14,86)=1.153$, $p<.0001$), a significant interaction of construction and group ($F(2,86)=17.894$, $p<.0001$), and a significant interaction of verb type and construction and group ($F(14,86)=2.672$, $p<.001$). The overall ANOVA confirms that the three groups perform differently with their judgments, manifesting a different pattern with verb types among the three groups. In addition, the ANOVA shows that the informants differentiate among the verb types and also between the constructions: [+QF] and [-QF]. This is an interesting finding, because both the [+QF] and [-QF] constructions are basically grammatical with unaccusative verbs, but the informants still make a distinction between the constructions.

In order to specify the location of significance, a two-way ANOVA was performed for each group. The ANOVA for Group 1 shows only a main effect of verb type ($F(7,28)=2.849$, $p<.007$), which means that Group 1 makes a distinction among the verb types, but treat [+QF] and [-QF] sentences in almost the same way. Pairwise comparison tests within the verb type do not show a significant difference with any verb type. However, across verb types the tests show a significant effect between [+QF] sentences with change of location verbs & appearance verbs ($p<.004$), change of location verbs & concrete state verbs ($p<.007$), change of location verbs & abstract/mental state verbs ($p<.004$), change of state verbs & abstract/mental state

verbs ($p<.002$), change of state verbs & concrete state verbs ($p<.016$), change of state verbs & abstract/mental state verbs ($p<.008$), pre-existing condition verbs & abstract/mental state verbs ($p<.048$), simple position & abstract/mental state verbs ($p<.028$); between [-QF] sentences only with change of state verbs & concrete states verbs ($p<.033$).

The ANOVA for Group 2 shows a main effect of verb type ($F(7,30)=2.998$, $p<.005$), and also a main effect of construction ($F(1,30)=4.458$, $p<.043$) unlike Group 1. Pairwise comparison tests within the verb type yield a significant difference with directed motion verbs ($p<.004$), abstract/mental state verbs ($p<.046$). The tests across the verb types show a significant effect between [+QF] with directed motion verbs & change of state verbs ($p<.005$), directed motion verbs & pre-existing condition verbs ($p<.003$), change of state verbs & abstract/mental state verbs ($p<.043$), appearance verbs & pre-existing condition verbs ($p<.007$), pre-existing condition verbs & concrete states verbs ($p<.016$), pre-existing condition verbs & simple position verbs ($p<.049$), pre-existing condition & abstract/mental state verbs ($p<.005$); between [-QF] sentences with change of location verbs & concrete state verbs ($p<.010$), directed motion verbs & concrete state verbs ($p<.015$), pre-existing condition verbs & concrete state verbs ($p<.011$), and concrete state verbs & appearance verbs ($p<.045$).

The ANOVA for Group 3 shows a main effect of verb type ($F(7,28)=15.039$, $p<.0001$), a main effect of construction ($F(1,28)=29.741$, $p<.0001$), and a significant interaction of verb type and construction ($F(7,28)=3.602$, $p<.001$). which presents a clear contrast with Group 1 and Group 2. The results indicate that Group 3 clearly differentiate among the verb types, and also between [+QF] and [-QF] constructions regardless of the fact that both [+QF] and [-QF] constructions are possible with unaccusatives. Pairwise comparison tests within the verb type show a significant difference with change of location verbs ($p<.011$), directed motion verbs ($p<.0001$), change of state verbs ($p<.013$), abstract/mental state verbs ($p<.0001$). The tests across the verb types produce a significant effect between [+QF] sentences with change of location & abstract/mental state verbs ($p<.0001$), directed motion verbs & change of state verbs ($p<.028$), directed motion verbs & abstract/mental state verbs ($p<.0001$), appearance verbs & pre-existing condition verbs ($p<.012$), appearance verbs & abstract/mental state verbs ($p<.0001$), pre-existing condition verbs & abstract/mental state verbs ($p<.0001$), simple position verbs & abstract/mental state verbs ($p<.001$); between [-QF] sentences with change of location verbs & abstract/mental state verbs ($p<.0001$),

directed motion verbs & abstract/mental state verbs ($p<.0001$), change of state verbs & concrete state verbs ($p<.008$), change of state verbs & concrete state verbs ($p<.045$), change of state verbs & abstract/mental state verbs ($p<.0001$), appearance verbs & simple position verbs ($p<.019$), appearance verbs & abstract/mental state verbs ($p<.004$), pre-existing condition verbs & abstract/mental state verbs ($p<.0001$), concrete state verbs & abstract/mental state verbs ($p<.0001$), concrete state verbs & abstract/mental state verbs ($p<.004$), simple position verbs & abstract/mental state verbs ($p<.0001$).

6.4.9.1.3 Monadic-Unaccusative verbs combined version

In the process of analysis, it was decided that the first three categories of unaccusative verbs (verbs of change of location, directed motion, and change of state) were combined into a single category named “verbs of change”, because no significant differences were found among these three categories. Also, the last three categories (verbs of concrete state, simple position, and abstract state) were combined into one category, “verb of state” for the same reason. ANOVAs and pairwise comparisons were therefore performed on these combined categories. The mean acceptability judgments of the three groups of unaccusative verbs are shown in Tables 6-10, 6-11, 6-12, and Figures 6-7, 6-8, 6-9.

Table 6-10. Group 1: Mean acceptability judgments on unergative verbs

	change	appearance	pre-existing condition	state
NQF	3.11	3.01	3.15	3.00
QF	3.12	2.97	3.05	3.01

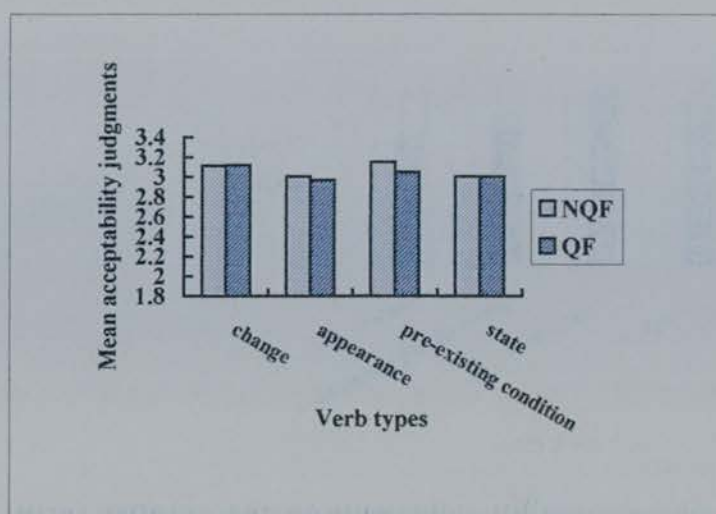


Figure 6-7. Group 1: Mean acceptability judgments on unaccusative verbs

Table 6-11. Group 2: Mean acceptability judgments on unaccusative verbs

	change	appearance	pre-existing condition	state
NQF	2.19	1.98	2.17	2.12
QF	2.11	1.99	2.11	2.03

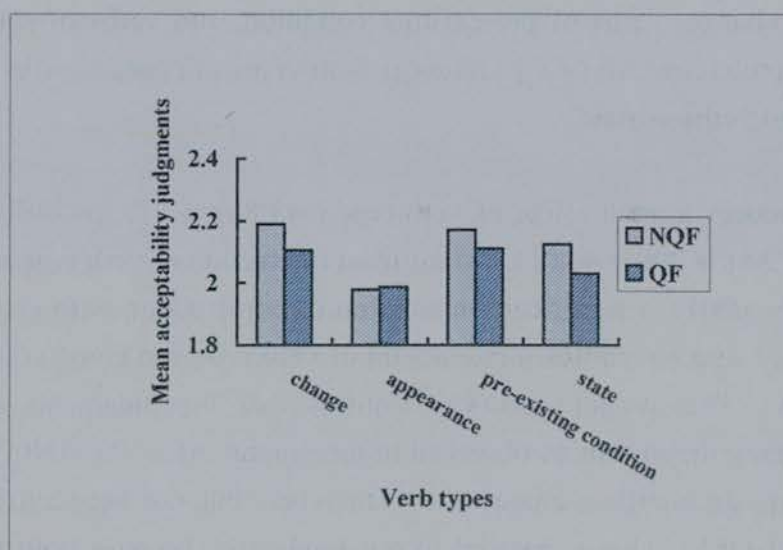


Figure 6-8. Group 2: Mean acceptability judgments on unaccusative verbs

Table 6-12. Group 3: Mean acceptability judgments on unaccusative verbs

	change	appearance	pre-existing condition	state
NQF	3.28	3.15	3.28	3.13
QF	3.07	3.17	3.00	2.82

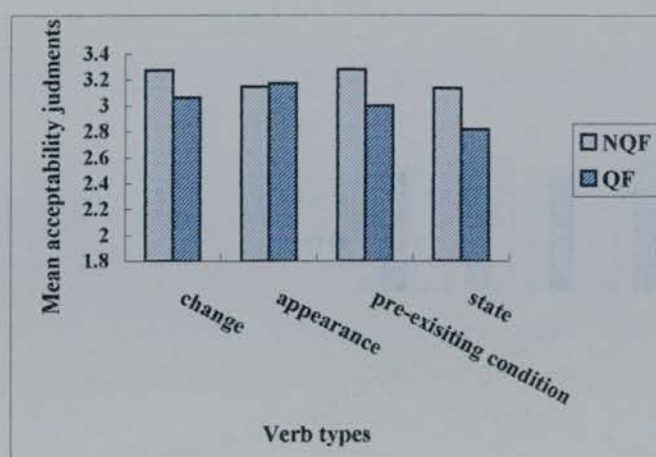


Figure 6-9. Group 3: Mean acceptability judgments on unaccusative verbs

The graphs indicate that none of the groups shows the same pattern in their judgments. The post-beginners (Group 1) do not seem to differentiate between [-QF] sentences and [+QF] sentences except for verbs of pre-existing condition which show a slight preference for [-QF] sentences. On the contrary, the intermediates (Group 2) and the native controls (Group 3) make a clear distinction between [-QF] sentences and [+QF] sentences with some verb types. Group 2 shows a definite preference for [-QF] sentences with verbs of change, verbs of pre-existing condition, and verbs of state. Group 3 indicate a clear preference for [-QF] sentences with verbs of change, verbs of pre-existing condition, and verbs of state.

The overall ANOVA produces a main effect of verb type ($F(3,86)=4.172, p<.007$), a main effect of group ($F(2,86)=8.200, p<.001$), a significant interaction of verb type and group ($F(6, 86)=5.931, p<.0001$), a significant interaction of construction with group ($F(2,86)=12.552, p<.0001$), and a significant interaction of verb type and construction ($F(6,86)=3.324, p<.020$). The overall ANOVA confirms that the judgments are significantly different among the groups as observed in the graphs. Also, the ANOVA shows that the informants differentiate among the verb types, but not between the constructions:[+QF] and [-QF]. This is parallel to our prediction, because both the [+QF] and [-QF] constructions are grammatical with unaccusative verbs.

In order to specify the location of significance, a two-way ANOVA was performed for each group. The ANOVA for Group 1 shows only a main effect of verb type ($F(3,28)=3.276, p<.025$), which means that Group 1 make a distinction among the verb types, but treat [+QF] and [-QF] sentences in almost the same way. Pairwise

comparison tests within the verb type do not show a significant difference with any verb type, but across verb types, the tests show a significant effect between [+QF] sentences with state verbs & change verbs ($p<.026$), between [-QF] sentences with state verbs & pre-existing condition verbs ($p<.002$), and state verbs & change verbs ($p<.013$). The results from pairwise comparison tests also support the ANOVA data.

The ANOVA for Group 2 also shows only a main effect of verb type ($F(3,30)=5.857$, $p<.001$), which is parallel to the results for Group 1. However, unlike Group 1, pairwise comparison tests within the verb type yield a significant difference with state verbs ($p<.030$). The tests across the verb types show a significant effect between [-QF] with state verbs & appearance verbs ($p<.014$), pre-existing condition verbs & appearance verbs ($p<.007$), and appearance verbs & change verbs ($p<.005$). However there is no significant difference seen between [+QF] sentences with any verb type. The results from the pairwise comparison tests indicate that Group 2 differentiate among the verb types slightly more than Group 1, and also differentiates between [+QF] and [-QF] with peripheral verb types such as “state” verbs.

The ANOVA for Group 3 shows a main effect of verb type ($F(3,28)=7.387$, $p<.0001$), a main effect of construction ($F(1,28)=19.345$, $p<.0001$), and a significant interaction of verb type and construction ($F(3,28)=5.875$, $p<.001$), which presents a clear contrast to Group 1 and Group 2. The results indicate that Group 3 clearly differentiates among the verb types, and also between [+QF] and [-QF] constructions regardless of the fact that both [+QF] and [-QF] constructions are possible with unaccusatives. Pairwise comparison tests within the verb type show a significant difference with pre-existing condition verbs ($p<.013$), state verbs ($p<.0001$), which is close to the prediction of the Split Intransitivity Hierarchy: native speakers of Japanese would show less acceptability to [+QF] sentences with peripheral verbs such as pre-existing condition verbs and state verbs. The tests across the verb types produce a significant effect between [+QF] sentences with change verbs & pre-existing verbs ($p<.001$), change verbs & state verbs ($p<.011$), appearance verbs & pre-existing verbs ($p<.012$), appearance verbs & state verbs ($p<.0001$), and pre-existing verbs & state verbs ($p<.009$), between [-QF] sentences with change verbs & appearance verbs ($p<.013$), and change verbs & state verbs ($p<.011$). These results also confirm that the native controls make a clearer and finer distinction among the verb types especially with the [+QF] construction.

6.4.9.1.4 Summary of findings for Monadic verbs in Experiment I

The analysis of judgments for monadic verbs provides results corresponding to the prediction of the Split Intransitivity Hierarchy concerning unergative verbs. Native controls differentiate between [+QF] and [-QF] constructions clearly, and reject [+QF] sentences more forcefully with the core verb types in the hierarchy such as motional process verbs and non-motional process verbs, which is parallel to what was predicted in the Split Intransitivity Hierarchy. This trend is observed not only in native Japanese speakers, but also in the intermediates (Group 2), which shows that the pattern in judgments gets closer as learners develop in their language proficiency.

The results for unaccusatives show an interesting pattern. Recall that unaccusativity in Japanese exhibits syntactic optionality between the [+QF] and [-QF] constructions. What is commonly observed between the two learner groups is that they do not show any preference for either construction but treat them in the same way. In contrast, the native speakers differentiate between the [+QF] and [-QF] constructions with peripheral verbs such as pre-existing verbs though they do not exhibit any preference for the construction with core verb types. These results deliver two main findings. First, it may be plausible to say that not only the native speakers but also the learners would be aware of the syntactic optionality with unaccusatives in Japanese. Second, native speakers make finer distinction among verb types despite the fact that unaccusatives in Japanese exhibit optionality between the [\pm QF] constructions.

6.4.9.2 Dyadic verbs

6.4.9.2.1 Results

The mean acceptability judgments of the three groups of dyadic verbs is presented in Tables 6-13, 6-14, 6-15, and Figures 6-10, 6-11, 6-12.

Table 6-13. Group 1: Mean acceptability judgments on dyadic verbs

	unspecified	sino- unspecified	specified	only transitive	sino-only transitive	psych verbs
inchoative	3.29	3.22	3.18	2.74	2.96	2.94
passive	3.19	3.20	3.05	3.22	3.13	3.13

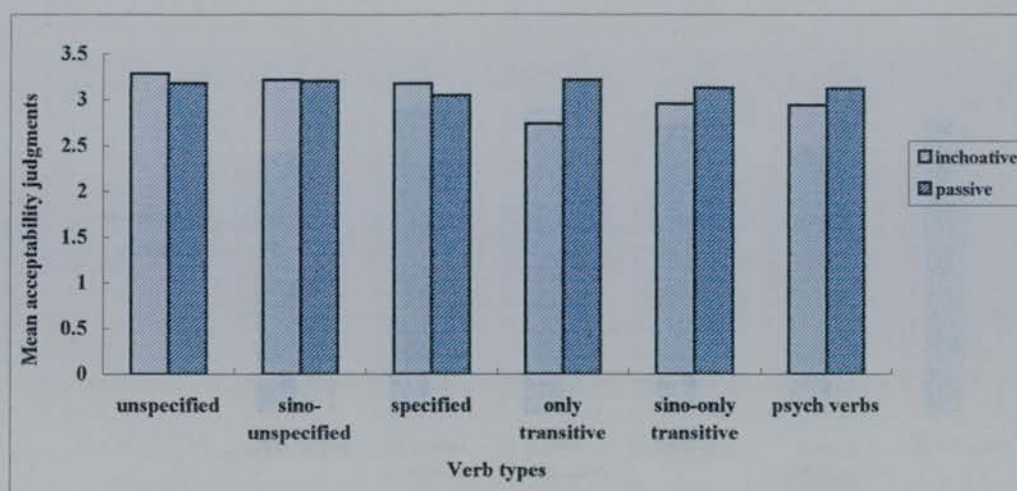


Figure 6-10. Group 1: Mean acceptability judgments on dyadic verbs

Table 6-14. Group 2: Mean acceptability judgments on dyadic verbs

	unspecified	sino-unspecified	specified	only transitive	sino-only transitive	psych verbs
inchoative	2.38	2.19	2.20	1.90	2.08	2.00
passive	2.21	2.25	2.30	2.38	2.25	2.09

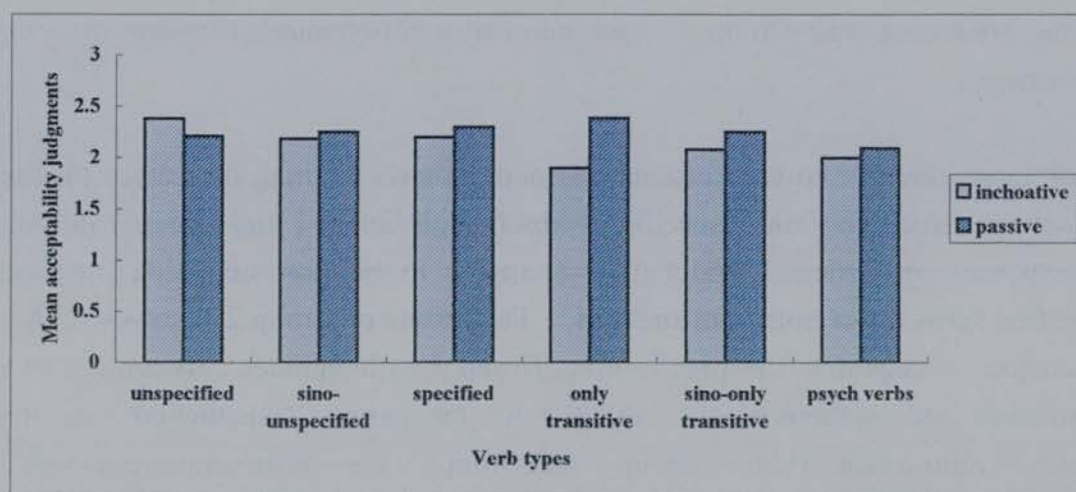


Figure 6-11. Group 2: Mean acceptability judgments on dyadic verbs

Table 6-15. Group 3: Mean acceptability judgments on dyadic verbs

	unspecified	sino-unspecified	specified	only transitive	sino-only transitive	psych verbs
inchoative	3.44	2.71	3.23	0.85	1.39	1.58
passive	3.25	2.94	3.16	3.36	3.35	2.85

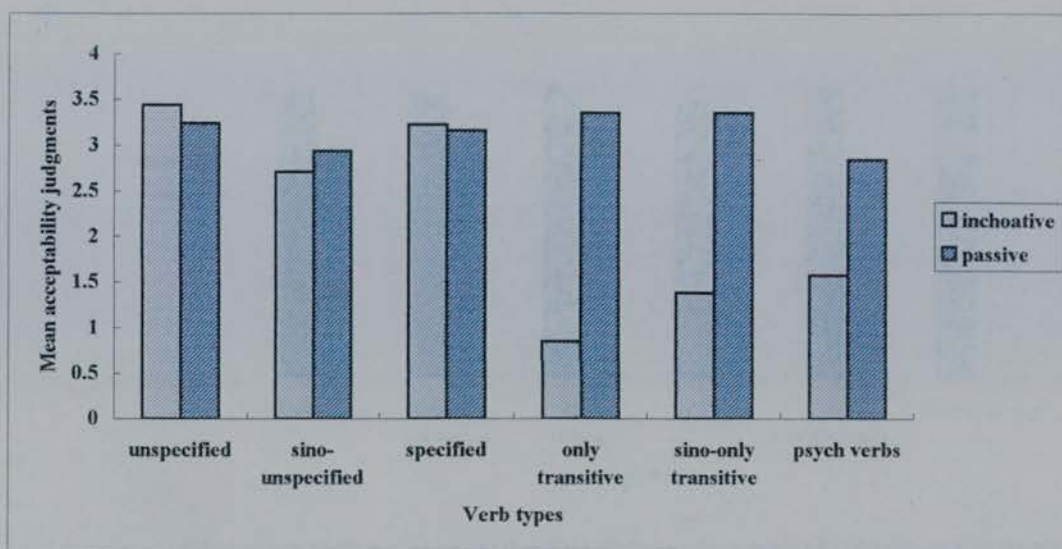


Figure 6-12. Group 3: Mean acceptability judgments on dyadic verbs

Overall, the post-beginners (Group 1), the intermediates (Group 2), and the controls (Group 3) share a similar pattern of preferences between inchoative and passive constructions except for specified agent verbs: Group 1 accepts the inchoative construction much more than the passive construction, but Group 2 displays the opposite preference and Group 3 does not really differentiate between the two constructions.

To look more closely into each category, Group 2 shows a strong preference for the inchoative construction with unspecified verbs though Group 1 and Group 3 do not. The responses by Group 1 and Group 3 appear to be less surprising, because unspecified verbs allow both constructions. The results of Group 2 deserves further examination. In regard to the psych verbs, Group 3 differentiates between the two constructions and preferences are exhibited for the passive construction over the inchoative construction, while in Group 1 and Group 2 these constructions are treated in almost the same way.

The overall ANOVA produces a main effect of verb type ($F(5,86) = 55.866, p < .0001$), a main effect of construction ($F(1,86) = 96.529, p < .0001$), a main effect of group ($F(2,86) = 4.992, p < .009$), a significant interaction of verb type and group ($F(10,86) = 22.599, p < .0001$), a significant interaction of construction and group ($F(2,86) = 48.819, p < .0001$), a significant interaction of verb type and construction ($F(5,86) = 70.411, p < .0001$), and a significant interaction of verb type, construction and

group ($F(10,86)=26.233, p<.0001$). The results of the ANOVA show a very strong significant effect with all the categories, but what is more crucial here is to specify the location which brings about the significant effect.

A two-way ANOVA was carried out to look more closely into the results. The ANOVA for Group 1 shows a main effect of verb type ($F(5,28)=7.265, p<.0001$), and a significant interaction of verb type and construction ($F(5,28)=4.909, p<.0001$). The results do not show any significant effect of construction, but reveal that Group 1 differentiates between two constructions with some verb types. Post-hoc pairwise comparison tests within and across the verb types were performed to pin down the location of the significance. Pairwise comparison tests within the verb type produce significant difference only with verbs of only transitive verbs ($p<.009$), but not a significant difference with any other verb types. Considering that only transitive verbs and Sino-only transitive verbs among all the verb types do not allow the inchoative construction, Group 1 appears to fail to reject the inchoative constructions with sino-only transitive verbs. Similarly, pairwise comparison tests do not yield any significant difference between inchoative and passive constructions with psych verbs ($p<.217$ ns) despite the fact that only the passive construction is grammatical. Recall that the inchoative constructions are made up with Japanese SE (Subject-Experiencer) verbs and the *Target Subject Matter of Emotion* (see 4.3.1.4 for details) is ungrammatical, yet Group 1 fails to reject them. However, there are several pairs which yield significant difference across verb types; inchoative constructions with unspecified verbs & only transitive verbs ($p<.004$), only transitive verbs & sino-only transitive verbs ($p<.009$), and Sino-unspecified verbs & sino-only transitive verbs ($p<.047$). The results confirm that learners in Group 1 are aware of the distinction between those verb types which allow inchoative/transitive alternation and those which do not. What is notable is that the learners successfully differentiate between the alternating and non-alternating types with Sino-Japanese verbs despite of the fact that they lack morphological manifestation of the causative/inchoative alternation with a suffix. However, looking into the results more closely, it also produces a significant difference with transitive verbs & Sino-only transitive verbs as well. ($p<.009$). This results suggest that the learners of Group 1 do not reject the inchoative sentences of sino-only transitives as strongly as those of only transitive, which leads to the conclusion that Sino-Japanese verbs are more difficult items for learners.

The ANOVA for Group 2 yields a main effect of verb type ($F(5,30)=6.955, p<.0001$), a

main effect of construction ($F(1,30)=8.084, p<.008$), and a significant interaction of verb type and construction ($F(5,30)=6.970, p<.0001$). Unlike the ANOVA for Group 1, the ANOVA for Group 2 produces significant difference with construction as well, which means that Group 2 differentiates between inchoative and passive constructions regardless of verb types. Post-hoc pairwise comparison tests within the verb type produce a significant difference with unspecified agent verbs ($p<.039$), and only transitive verbs ($p<.0001$). Group 2 fails to reject the inchoative construction with Sino-only transitive verbs like Group 1. What is intriguing is that Group 2 significantly differentiates between the inchoative and passive constructions with unspecified agent verbs. This is not easy to interpret, because both constructions are supposed to be grammatical. With respect to psych verbs, pairwise tests do not produce any significant difference between inchoative and passive constructions ($p<.244$ ns). This indicates that Group 2 failed to reject the inchoative constructions, which are ungrammatical, as observed in Group 1. Pairwise comparison tests across verb types produce a significant difference between inchoative constructions with unspecified agent verbs & sino-unspecified verbs ($p<.009$), specified agent verbs & only transitive verbs ($p<.005$), only transitive verbs & sino-only transitive verbs ($p<.008$), unspecified verbs & specified verbs ($p<.0001$). A significant difference with specified agent verbs & only transitive verbs ($p<.005$) confirms that Group 2 are aware of the distinction between alternating and non-alternating verbs. However significant difference with unspecified verbs & specified agent verbs ($p<.0001$) also suggests that they do not accept the inchoative construction of specified verbs as much as that of unspecified verbs. This seems to stem from the fact that their L1 (English) does not allow specified verbs to be embedded in the inchoative construction, but since Group 1 do not show the same results, there is no way to confirm this point. A significant difference with unspecified agent verbs & sino-unspecified verbs ($p<.009$) and with only transitive & sino-only transitive verbs ($p<.008$) confirm the findings obtained from the results of Group 1: learners are not as determinate with sino-verbs as with Japanese origin verbs.

The ANOVA for Group 3 produces a main effect of verb type ($F(5,28)=43.696, p<.0001$), a main effect of construction ($F(1,28)=97.352, p<.0001$), and a significant interaction of verb type and construction ($F(5,28)=75.390, p<.0001$). The results reveal that the native Japanese speakers clearly differentiate between verb types and constructions. Post-hoc pairwise comparison tests within and across the verb types were performed to pin down the location of the significance. Pairwise comparison

tests within the verb type produce significant differences with unspecified agent verbs ($p < .0001$), sino-unspecified verbs ($p < .006$), only transitive verbs ($p < .0001$), sino-only transitive verbs ($p < .0001$), and psych verbs ($p < .0001$). Unlike Group 1 and Group 2, Group 3 make distinction between inchoative and passive constructions with all verb types except for specified agent verbs. It seems to be interesting that the native Japanese speakers show a preference for the inchoative construction with unspecified verbs as observed in Group 2, and a preference for the passive construction with sino-unspecified verbs, because these verb types are supposed to allow both constructions. This point deserves further consideration. Group 3 also shows a different pattern of responses with psych verbs from the other two groups. Pairwise comparison tests produce significant differences between inchoative and passive constructions ($p < .0001$). Since Group 3 displays a strong preference for the passive construction over the inchoative construction with psych verbs, it is confirmed that Group 3 correctly rejects the inchoative construction, which is ungrammatical. Pairwise comparison tests across verb types yield a significant difference between inchoative constructions with unspecified verbs & sino-unspecified verbs ($p < .0001$), specified agent verbs & only transitive verbs ($p < .0001$), only transitive verbs & sino-only transitive verbs ($p < .001$), unspecified verbs & specified agent verbs ($p < .002$), and sino-unspecified verbs & sino-only transitive verbs ($p < .0001$).

6.4.9.2.2 Summary of findings for dyadic verbs in Experiment I

The results obtained for dyadic verbs exhibit a contrast in judgments between the learner groups and the native controls, which is especially clearly observed with Sino-only transitive verbs and psych verbs. One of the purposes of this study was to see whether L2 learners would make a distinction between alternating and non-alternating verbs in Japanese; and with respect to this point, the results brought about a very interesting finding—learners experience more difficulty in making a distinction between alternating and non-alternating verbs when the verbs lack an overt morphological feature. For instance, Group 1 and Group 2 did not have any problem with the pseudo inchoative counterpart with only transitive verbs which were made up with a morphological manifestation, but with Sino-Japanese verbs which do not mark the alternation with morphology, these groups fail to reject the pseudo inchoative construction. This result implies that morphology might hold a key role for the distinction between alternating and non-alternating verbs.

Another interesting issue which the results raised is that learners' L1 knowledge of the intransitive/transitive alternation might not really affect their judgments. That is, learners correctly accept inchoative and passive constructions with specified verbs, with which the alternation is allowed in Japanese, but not in English. What this result indicates is parallel to Montrul's view on transfer—UG has an influence at the argument-structure level, while L1 knowledge is involved in L2 acquisition at the morphological level (see section 5.1.3 for details).

Finally, the results of psych verbs confirm our prediction—the difference in correspondence of OE (Object Experiencer) and SE (Subject Experiencer) verbs between Japanese and English would make learners experience some difficulty in judgments for SE verbs. The results revealed that neither Group 1 nor Group 2 succeeds in rejecting the inchoative constructions with psych verbs, which are ungrammatical, and this is parallel to what was predicted.

6.5 Experiment II

6.5.1 Introduction

This section will summarise the results of Experiment II. The results from main study I led us to conduct further research on split intransitivity with other diagnostic constructions in Japanese.

6.5.2 Questions to be addressed

The aim of the study is to investigate whether learners of Japanese are sensitive to the lexical-semantic features of split intransitivity. The questions to be addressed are as follows:

1. Will the characteristics of the Split Intransitivity Hierarchy be reflected in judgments of split intransitivity phenomena by L2 learners of Japanese?
2. Will the characteristics of verbs denoting involuntary processes be judged less consistently, and the characteristics of verbs denoting non-motional processes be judged more consistently, by L2 learners of Japanese? Similarly, will the characteristics of verbs denoting change of location be more determinate, and the characteristics of stative verbs be less determinate in their judgments on unaccusatives?
3. Will the distinction between alternating and non-alternating verbs be harder to judge by L2 learners of Japanese, in the cases where these verbs lack an overt morphological feature, as they do in English?
4. When L2 learners of Japanese cannot get any information about the verb's properties from overt morphological forms, will they transfer their L1 knowledge of the intransitive/transitive alternation to Japanese?
5. Will L2 learners of Japanese show a preference for the passive construction over the inchoative construction with alternating verbs?
6. Will learners of Japanese find any difficulty in judgments for Subject-Experiencer (SE) verbs? Also, will they be aware of the overt causative morphology in Japanese psychological verbs?
7. Will English-speaking learners accept Object-Experiencer (OE) verbs more readily than the native control group does as suggested in White (1998,1999)?

6.5.3 Hypotheses

Based on the Split Intransitivity Hierarchy, the following hypotheses are constructed for monadic and dyadic verbs.

1. Learners would show a stronger preference for grammatical sentences over ungrammatical sentences with core unergative verbs, and a weaker preference with peripheral unergative verbs.
2. Learners would be better able to recognize the grammaticality of optional constructions with core unaccusative verbs than with peripheral unaccusative verbs.
3. Even if the learners' L1 does not have overt morphology which distinguishes between intransitive and transitive verbs, the overt morphology would be of some help in learning the difference between them. Thus the subset of verbs in Japanese which are morphologically identical in their inchoative and causative forms may also be of difficulty for English speaking learners of Japanese.
4. If Montrul's view of transfer is plausible, L1 is not supposed to play a role at the argument structure level. Thus, English speaking learners of Japanese would not transfer their L1 knowledge of the causative/inchoative alternation to Japanese.
5. Learners would find Subject-Experiencer (SE) verbs in Japanese difficult, because there is a difference in correspondence of Object-Experiencer (OE) and SE verbs between Japanese and English – several SE verbs in Japanese correspond to OE verbs in English.

7.5.4 Participants

A total of 71 subjects participated in the study: a group of 35 adult native speakers of English, who were about to complete a 10 month Japanese Course offered at Kansai University of Foreign Studies in Osaka, and a group of 36 adult native speakers of Japanese as controls who were studying at the University of Kumamoto. With respect to the learners group, their age at the time of testing ranged from 20 to 25, and all of them had studied Japanese in a school setting for more than two years and started learning Japanese as adults. They had little exposure to Japanese except in the classroom setting until they came to study in Japan.

Before starting the main session, all the participants took a cloze test and a vocabulary test so as to ascertain that their proficiency level was not significantly different. The

cloze test was made from a short passage by eliminating every ninth word, which provided six blanks. Multiple choices were given under the passage to complete each blank with. The vocabulary test consisted of 10 verbs. The participants were asked to choose the meaning provided in English, which matched each Japanese verb, and to connect them with a line. The results of the tests are presented in Table 6-16.

Table 6-16: Results of the cloze test and vocabulary test

Group	cloze test		vocabulary test	
	Mean	SD	Mean	SD
group 1(N=35)	2.54	1.7	7.34	2.55

The results of the cloze test show that the subjects' proficiency level will be placed between the post-beginners and the intermediates. The familiarity with the lexical items chosen for the task was confirmed by the results as well.

6.5.5 Materials

Two different tasks were used for this experiment; a picture judgment task and a Magnitude Estimation (ME) task. The picture judgment task was designed to test the interpretation of the *takusan* construction, consisting of 26 sentences paired with each picture.

6.5.5.1 Picture Judgment Task

For the picture judgment task, one verb from each verb type in the Split Intransitivity Hierarchy was employed as shown in Table 6-17.

Table 6-17 List of verbs in the Picture judgment task

<Unergative>	
Controlled non-motional process:	<i>utau</i> 'sing',
Controlled motional process:	<i>oyogu</i> 'swim',
Uncontrolled process-bodily function:	<i>asebamu</i> 'sweat',
Uncontrolled process-involuntary reaction:	<i>furueru</i> 'shiver',
Uncontrolled process-emission:	<i>kagayaku</i> 'shine',
<Unaccusative>	
Change of location:	<i>tuku</i> 'arrive',
Change of condition-directed motion:	<i>noboru</i> 'ascend',
Change of condition-change of state:	<i>sioreru</i> 'wilt'
Change of condition-appearance:	<i>arawareru</i> 'appear',
Condition of pre-existing condition:	<i>nokoru</i> 'remain'
Existence of a condition-concrete states:	<i>aru</i> 'be'
Existence of condition-simple position:	<i>yokotawaru</i> 'lie'
Existence of condition-abstract/mental state:	<i>yorokobu</i> 'please'

6.5.5.1.1 The *takusan* construction

Each sentence appeared twice, paired with two different pictures. The participants were asked to judge each item according to whether the sentence correctly described the picture by choosing between true and false on the answer sheet.

(279) unergative

- *a. Takusan hiru-emasu-ta
a lot shiver-Polite-PAST
“A lot of people shivered”

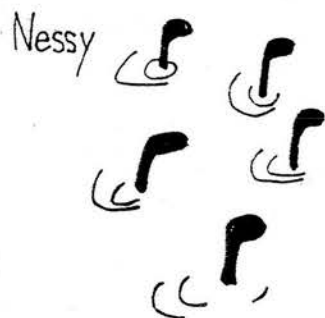


- b. Takusan hiru-emasu-ta
a lot shiver-polite-PAST
“One person shivered a lot”

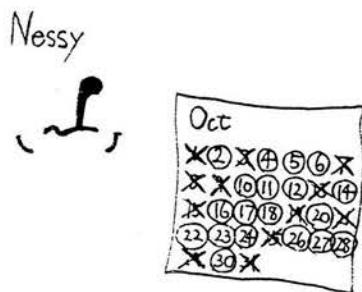


(280) unaccusative

- a. Takusan arawar-emasi-ta
 a lot appear-Polite-PAST
 “A lot of monsters appeared”



- *b. Takusan arawar-emasi-ta¹³
 a lot appear-Polite-PAST
 “One monster appeared a lot”



Recall that *takusan* “a lot” is generated within the VP and only modifies the internal argument of the verb. Therefore unergatives as in (279), which do not have an internal argument, only receive an adverbial reading, describing the frequency of action. On the other hand, as unaccusatives have an internal argument, *takusan* functions as a quantified NP.

6.5.5.2 Magnitude Estimation (ME) task

There were two constructions tested with the Magnitude Estimation (ME) task (see 6.3.4 for details): *kake* deverbal nominalization, Sino-Japanese compounding verbs, and

¹³ One of the informants points out that there is still some possibility of this reading.

psychological verbs. A total of 84 sentences were presented, which consisted of 39 sentences with the *kake*-construction and 45 sentences with Sino-Japanese compounding verbs.

6.5.5.2.1 *kake*-construction¹⁴

There were 39 sentences concerning the *kake*-construction. Three verbs from each verb type on the Split Intransitivity Hierarchy were employed. The verbs employed were as follows:

Table 6-18 List of verbs in the ME test

<Unergative>	
Controlled non-motional process:	<i>utau</i> 'sing', <i>asobu</i> 'play', <i>matu</i> 'wait'
Controlled motional process:	<i>oyogu</i> 'swim', <i>aruku</i> 'walk', <i>hasiru</i> 'run'
Uncontrolled process-bodily function:	<i>haku</i> 'vomit', <i>sekikom</i> 'cough', <i>asebamu</i> 'sweat'
Uncontrolled process-involuntary reaction:	<i>hurueru</i> 'shiver', <i>yureru</i> 'tremble', <i>guratuku</i> 'waver'
Uncontrolled process-emission:	<i>hikaru</i> 'flash', <i>kagayaku</i> 'shine', <i>niou</i> 'smell'
<Unaccusative>	
Change of location:	<i>tuku</i> 'arrive', <i>kuru</i> 'come', <i>saru</i> 'leave'
Change of condition-directed motion:	<i>noboru</i> 'ascend', <i>susumu</i> 'advance', <i>agaru</i> 'rise'
Change of condition-change of state:	<i>kusaru</i> 'rot', <i>kutiru</i> 'decay', <i>sioreru</i> 'wilt'
Change of condition-appearance:	<i>arawareru</i> 'appear', <i>okoru</i> 'happen', <i>syoziru</i> 'arise'
Condition of pre-existing condition:	<i>tomomaru</i> 'stay', <i>tuduku</i> 'continue', <i>nokoru</i> 'remain'
Existence of a condition-concrete states:	<i>aru</i> 'be', <i>iru</i> 'need', <i>sonzai-suru</i> 'exist'
Existence of condition-simple position:	<i>yokotawaru</i> 'lie', <i>motareru</i> 'lean', <i>syagamu</i> 'crouch'
Existence of condition-abstract/mental state:	<i>yorokobu</i> 'please', <i>maniau</i> 'suffice'

Recall that as analysed in Kishimoto (1996) (see section 3.1.6 for details), a deverbal nominal with *kake* modifies the NP, which is restricted to the object of a transitive verb or the subject of an unaccusative verb, but not the subject of a transitive verb or an unergative verb. Apart from this syntactic constraint, the semantic properties of verbs with the suffix *kake* are also limited, because the deverbal nominal expression describes an entity which denotes the initial point of an event and "some indication of the event" (Kishimoto 1996:260). Thus, verbs suffixed with *kake* have to imply a discrete initial point and also some time span. Examples of the test items are presented in (281a) and (281b).

¹⁴Tsujimura and Ida (1999) had not been published yet when the current study was designed for the test administration. Thus, their claim on the two readings which the *kake* construction exhibits were not introduced in this study, but it was employed for Study 3.

- (281) a. unaccusative
 agari – kake –no tako
 rise – KAKE-GEN kite
 “a half-risen kite”
- b. unaccusative
 *hikari-kake-no-heddo-raito
 flash-kake-GEN – headlight
 “a half-shone headlight”

The hypotheses based on the Split Intransitivity Hierarchy predicted that:

1. Learners would be better able to reject the *kake*-construction with core unergative verbs than with peripheral unergative verbs.
2. Learners would not be able to make a finer distinction between unaccusative verbs which allow the *kake* construction than those which do not.
3. The native control group would clearly specify the subset of unaccusative verb types which allow the *kake* construction, but even among the native speakers of Japanese, their judgments would differ with the peripheral verbs among unergatives and unaccusatives.

6.5.5.2.2 Sino-Japanese verbs

45 sentences with Sino-Japanese compounding verbs were included in the ME test. Like Japanese origin verbs, Sino-Japanese verbs are also subcategorised based on properties such as monadic/dyadic, alternating/non-alternating, and so on. The following three different types of Sino-Japanese verbs were employed for study.

Table 6-19: Sino-Japanese verbs used in ME task¹⁵

Verb group	type	intransitive	transitive
Alternating Sino-Japanese verbs	(a)	kaisi-suru 'start'	kaisi-suru 'start'
		syuryou-suru 'finish'	syuryou-suru 'finish'
		idou-suru 'move'	idou-suru 'move'
		teisi-suru 'stop'	teisi-suru 'stop'
		keizoku-suru 'continue'	keizoku-suru 'continue'
		bunkai-suru 'decompose'	bunkai-suru 'decompose'
	(b)	kettei-suru '*decide (<i>int</i>)'	kettei-suru 'decide'
		enki-suru '*postpone (<i>int</i>)'	enki-suru 'postpone'
		kakudai-suru '*enlarge(<i>int</i>)'	kakudai-suru 'enlarge'
Non-alternating Sino-Japanese verbs	(c)	— '*abolish(<i>int</i>)'	haisi-suru 'abolish'
		— '*enforce (<i>int</i>)'	zissi-suru 'enforce'
		— '*analyze (<i>int</i>)'	bunseki-suru 'analyze'
		— '*confirm (<i>int</i>)'	kakunin-suru 'confirm'
		— '*study (<i>int</i>)'	kenkyu-suru 'study'
		— '*discuss (<i>int</i>)'	tooron-suru 'discuss'

Type (a) in the table is the alternating Sino-Japanese compounding verbs whose equivalents in English also allow the intransitive/transitive alternation as in (282). Type (b) is the alternating Sino-Japanese compounding verbs whose equivalents in English do not allow the intransitive/transitive alternation as in (283). Type (c) is the non-alternating Sino-Japanese compounding verbs whose equivalents in English do not have an inchoative counterpart either, as in (284).

(282) Both the Sino-Japanese verb and its English equivalent allow the transitive/intransitive alternation.

- ex. (a) Daigaku - ga betu-no mati-ni IDOU- si - ta
 university-NOM another-GEN town-to move-suru-PAST
 "The university has moved to another town"
- (b) Daigaku - o betu-no mati-ni IDOU- si - ta
 university-ACC another-GEN town-to move-suru-PAST
 "(He/she/we/they) has moved the university to another town."

¹⁵The number of items for each category is uneven, because the responses by the native control group brought up a useful suggestion on the classification of the items, so the analysis was done with the new classification.

(283) Only the Sino-Japanese verb allows the transitive/intransitive alternation.

- ex. (a) Kekkonsiki - no hidori-ga KETTEI-si-ta
 wedding ceremony- GEN date-NOM decide-suru-PAST
 "The date of the wedding ceremony *(was) decided "
- (b) Kekkonsiki - no hidori-o KETTEI-si-ta
 wedding ceremony- GEN date-ACC decide-suru-PAST
 "(He/she/we/they) decided the date of the wedding ceremony"

(284) Neither the Sino-Japanese verb nor its English equivalent allows the transitive/intransitive alternation.

- ex. (a)* Zikken- no kekka-ga BUNSEKI-si-ta
 experiment-GEN results-NOM analyze-suru-PAST
 "The results of the experiment was analyzed"
- (b) Zikken- no kekka-o BUNSEKI-si-ta
 experiment-GEN results-NOM analyze-suru-PAST
 "(He/she/we/they) analyzed the results of the experiment"

Based on the hypotheses, our predictions for Sino-Japanese compounding verbs were:

1. Learners would have more difficulty judging the transitive sentences of Sino-Japanese verbs whose equivalents in English do not alternate. If L1 influence is strong, learners would wrongly reject those sentences.
2. Even if the (a) and (c) types of verb exhibit the same alternation pattern in both English and Japanese, learners would still have some problems in making a distinction between these types because of the lack of any morphological manifestation of the causative/inchoative alternation. If L1 is simply transferred, it would not be any problem, but this is one of the issues which needs further investigation.

6.5.5.2.3 Psych verbs

There were 15 sentences with psych verbs. Five verb items were employed; *odoroku* (be surprised), *ochikomu* (be disappointed), *iratsuku* (be irritated), *okoru* (be offended) and *nayamu* (be troubled). Each verb consists of three construction types as in (285)

- (285) a. Kanozyo –wa kuruma- no zyuutai – ni iratui-ta
 she TOP car GEN congestion-by irritate-PAST
 “She was irritated by the traffic congestion.”
- b. * Kuruma-no zyuutai - ga kanozyo –o iratui-ta
 car – GEN congestion-NOM she -ACC irritate-PAST
 “The traffic congestion irritated her”
- c. Kuruma-no zyuutai - ga kanozyo- o iratuk –ase - ta
 car – GEN congestion-NOM she – ACC irritate-CAUSE-PAST
 “The traffic congestion made her irritated”

Recall that psych verbs are categorised into two classes: Subject-Experiencer (SE) verbs (ex. *fear, enjoy, dislike*), and Object-Experiencer (OE) verbs (ex. *frighten, amuse, distress*). Most of the psych verbs in Japanese belong to the SE class, and the periphrastic *(s)ase* construction is substituted for OE verbs, which means the causative morpheme *(s)ase* always needs to be attached when the Japanese equivalent of English OE verbs is required.

Thus, example (285c) is an OE construction with the periphrastic causative morpheme *(s)ase*, which is grammatical (COE), while (285b) is a pseudo OE construction without causative morpheme *(s)ase*, which is ungrammatical (UOE). (285a) is a simply grammatical SE construction, which is grammatical. Our predictions based on the hypotheses were:

1. Learners would be less determinate about rejecting the ungrammatical OE construction (UOE) such as (285b) than accepting correct SE construction such as (285a).
2. Learners would not be aware of the fact that there is a difference in distribution of OE and SE verbs — most of the psych verbs in Japanese belong to the SE class, and SE verb + periphrastic *(s)ase* construction is substituted in the absence of OE verbs.

6.5.6 Procedures

The picture judgment test was given first. The participants were asked to indicate if the illustration matched the sentence by choosing true or false. There were 26 pictures. They were given five minutes for this task. The picture judgment test was followed by

the Magnitude Estimation task. Prior to the main test, the participants had a short practice session so that they became familiar with the concept of proportionality. First, written instructions (in English for learners: Group 1, and in Japanese for the native controls: Group 2) were distributed to the participants, and then they were asked to make judgments on the line length. They were invited to ask questions for clarification before starting the experiment.

In the main test, the participants were presented with 84 sentences in isolation one by one on an overhead projector screen. The sentences were also recorded on tape so that the informants could listen to them as they appeared on the screen. There was an interval of seven seconds between each sentence.

6.5.7 Analysis

The data were transformed into log scores and all mathematical and statistical operations were performed based on these. First, the mean scores of acceptability judgments were calculated, which was followed by a three-way repeated measures ANOVA performed on unaccusative sentences and unergative sentences separately. The variables for each ANOVA consisted of verb type, construction, and proficiency group. Further ANOVAs were conducted on the results for each group, on both unergative and unaccusative verbs. If the ANOVA yielded a significant effect or interaction, post-hoc pairwise comparison tests were performed in order to specify the location of the difference. Pairwise comparison tests were performed both within categories and across categories for each group.

6.5.8 Results of Experiment II

6.5.8.1 Monadic verbs

6.5.8.1.1 Monadic - *takusan* construction-unergative verbs

The percentage of acceptance of the two groups (Group 1: learners, Group 2: native controls) for each reading is shown in Figure 1 and Tables 6-20,6-21, and Figures 6-13, 6-14.

Table 6-20. Group1: Percentage of acceptance for unergative verbs with *takusan*

	non-motional process	motional process	bodily function	involuntary reaction	process emission
subject	37.1	48.6	42.9	22.9	74.3
adverb	82.9	65.7	82.9	45.7	37.1

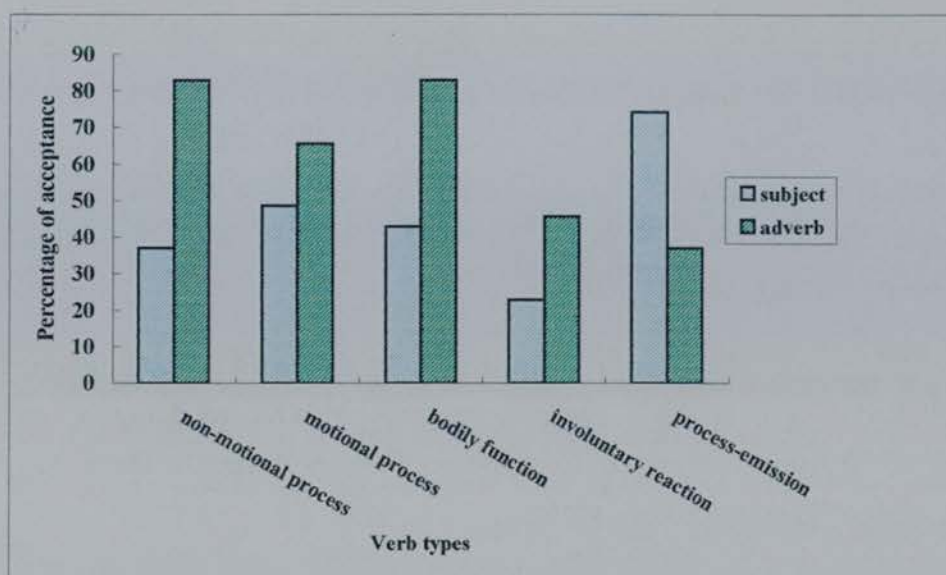


Figure 6-13. Group 1: Percentage of acceptance for unergative verbs with *takan*

Table 6-21. Group 2: Percentage of acceptance for unergative verbs with *takan*

	non-motional process	motional process	bodily function	involuntary reaction	process emission
subject	13.9	30.6	19.4	25	66.7
adverb	97.2	91.7	77.8	22.2	30.6

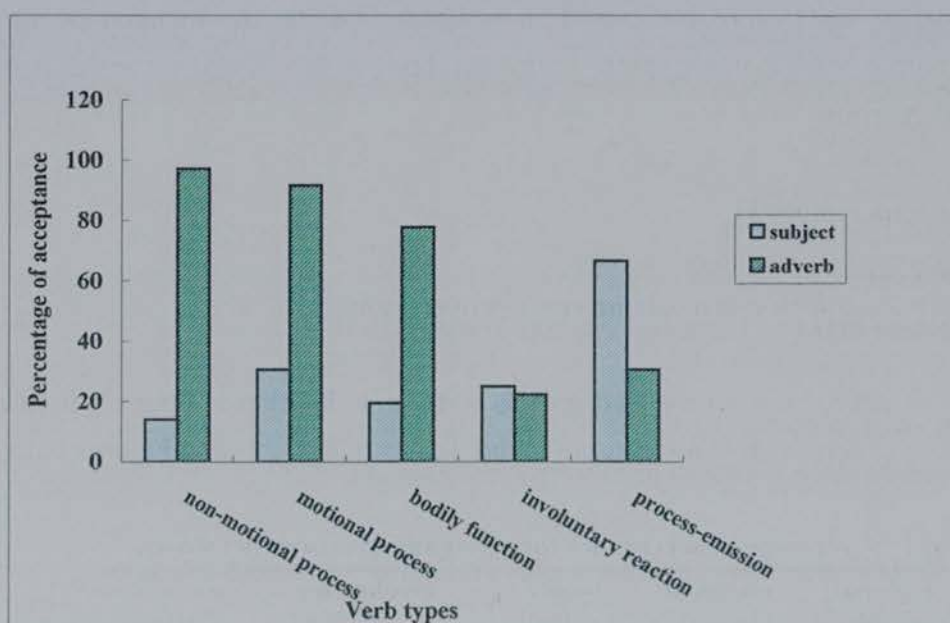


Figure 6-14. Group 2: Percentage of acceptance for unergative verbs with *takan*

The learners groups and the native controls show the same pattern of preference between the *subject* and the *adverb* reading with all verb types except for involuntary reaction verbs. Both groups readily accept the *adverb* reading for non-motional process, motional process, and bodily function, and the *subject* reading for process-emission, though the native controls have more determinate judgments and display greater preference for this reading than the learners group.

With respect to involuntary reaction verbs, the learners prefer the *adverb* reading, while the native controls show a slight preference for the *subject* reading over the *adverb* reading. The responses by the native controls are consistent with the predictions of the Split Intransitive Hierarchy. A Chi-Square test was performed to confirm the observation of the graphs.

Table 6-22. Pearson Chi Square Tests for unergative verbs with *takusan*

	df	Asymptotic Significance
Group 1(N=35)	4	.008
Group 2 (N=36)	4	.0001

The Chi-Square tests show a significant interaction of the verb types and the readings ($p<.008$) for the learner group and also for the native controls ($p<.0001$).

6.5.8.1.2 Monadic - *takusan* constructions-unaccusative verbs

Table 6-23, 6-24 and Figure 6-15,6-16 show the percentile of acceptance of the two groups for each reading.

Table 6-23. Group 1: Percentage of acceptance for unaccusative verbs with *takusan*

	change of location	directed motion	change of state	appearance	pre-existing condition	concrete states	simple position	abstract state
subject	85.7	51.4	77.1	60	82.9	91.4	40	45.7
adverb	20	42.9	31.4	45.7	14.3	22.9	65.7	62.9

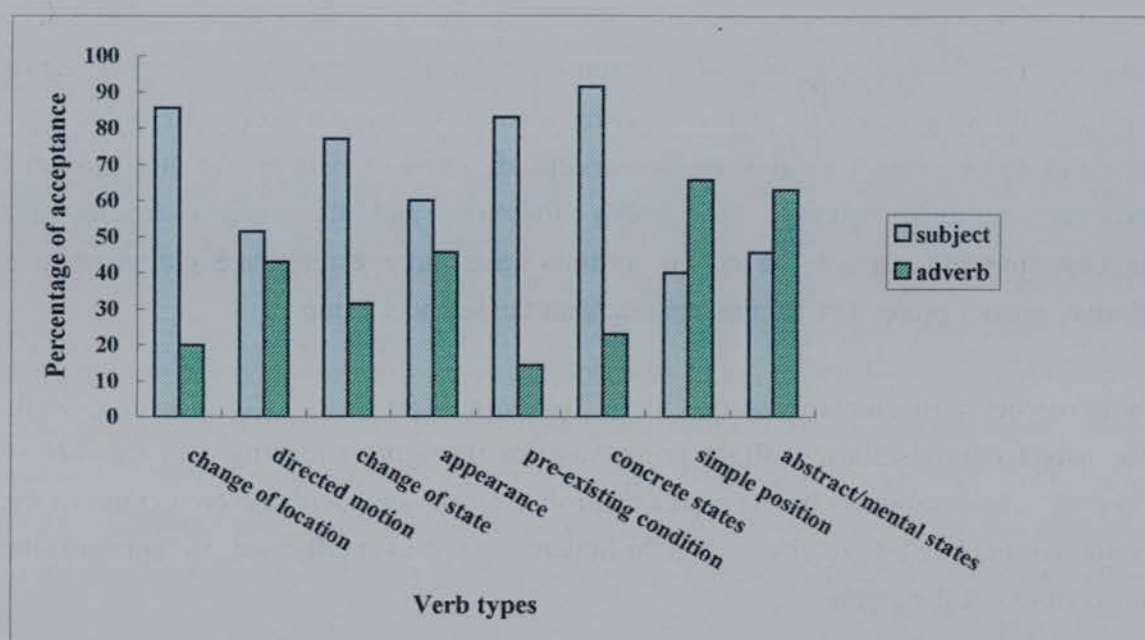


Figure6-15.Group 1: Percentage of acceptance for unaccusative verbs with *takusan*

Table 6-24. Group 2: Percentage of acceptance for unaccusative verbs with *takusan*

	change of location	directed motion	change of state	appearance	pre-existing condition	concrete states	simple position	abstract state
subject	97.2	58.3	91.7	100	94.4	97.2	63.9	30.6
adverb	8.3	44.4	0	41.7	0	22.2	19.4	55.6

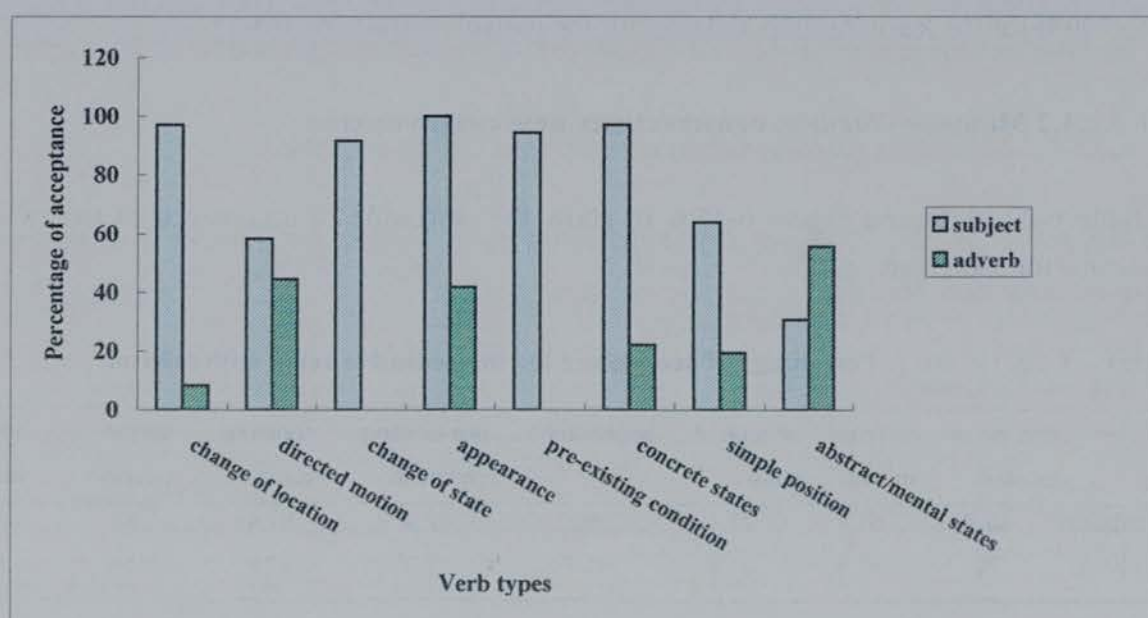


Figure6-16.Group 2: Percentage of acceptance for unaccusative verbs with *takusan*

Like the results for unergative verbs, the learner group (Group 1) and the native controls (Group 2) show the same pattern of preference between the *subject* and the *adverb* readings with all the verb types except for one verb type; simple position, where the learners group prefers the *adverb* reading, while the native control group prefers the *subject* reading.

The native control group shows greater determinacy in their judgments, especially for verb types such as Change of state and pre-existing condition, which receive the anonymous response for the *subject* reading. Some gradient effects along the hierarchy are seen; the *adverb* reading with abstract/mental state is more accepted by both groups, and the *adverb* reading with simple position verbs by Group 1 as well. With respect to directed motion, neither group accepts either the *subject* reading or the *adverb* reading. A Chi-Square test was performed to confirm the findings from the graphs.

Table 6-25. Pearson Chi Square Tests for unaccusative verbs with *takusan*

	df	Asymptotic Significance
Group 1(N=35)	7	.0001
Group 2(N=36)	7	.0001

The Chi-square test shows a significant interaction of the verb types and the readings ($p < .000$) for the learners group and for the native controls ($p < .0001$).

6.5.8.1.3 Monadic - *kake* construction-unergative verbs

Tables 6-26, 6-27 ,and Figures 6-17, 6-18 indicate the mean acceptability judgments of the two subject groups about unergative verbs.

Table 6-26. Group 1: Mean acceptability judgments on unergative verbs with *kake*

	non-motional process	motional process	bodily function	involuntary reaction	emission
+ <i>kake</i>	2.34	2.44	2.39	2.33	2.51

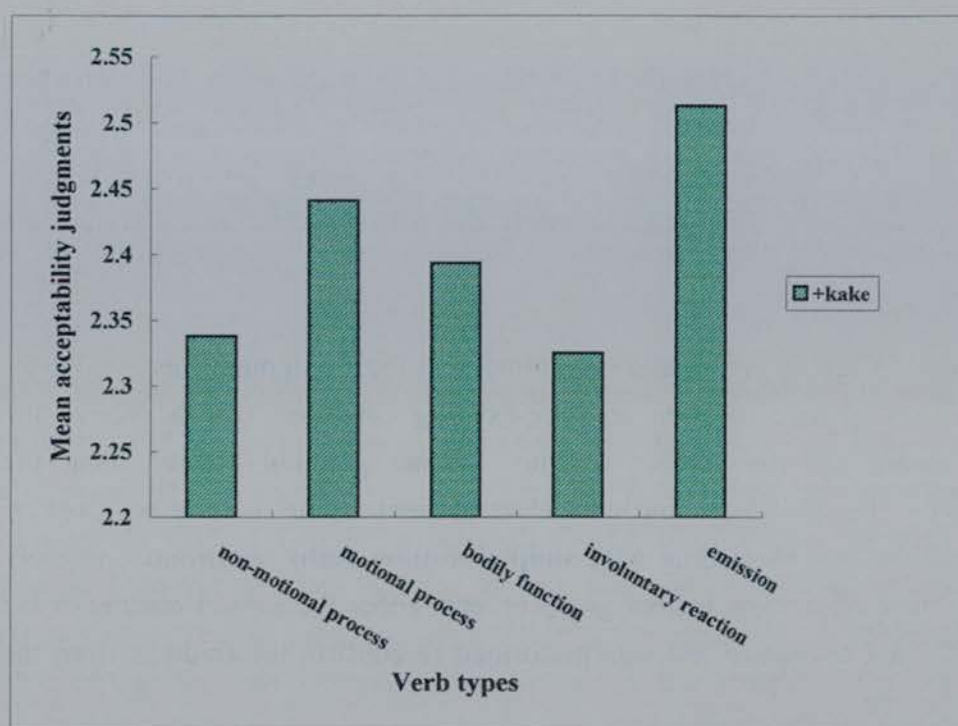


Figure 6-17.Group 1: Mean acceptability judgments on unergative verbs with *kake*

Table 6-27. Group 2: Mean acceptability judgments on unergative verbs with *kake*

	non-motional process	motional process	bodily function	involuntary reaction	emission
+kake	1.80	1.69	1.53	1.47	1.21

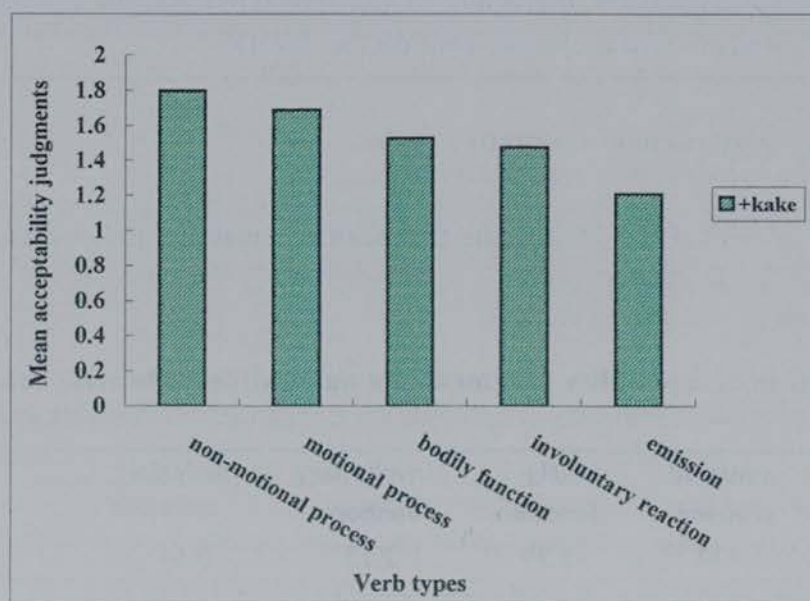


Figure 6-18.Group 2: Mean acceptability judgments on unergative verbs with *kake*

Figure 6-17 illustrates that English-speaking learners of Japanese show an uneven pattern across verb types in their judgments. In contrast, Figure 6-18 shows some gradient in their judgments, but the values gradually decline toward the peripheral, which is the opposite effect from the one expected. This issue needs further investigation.

The overall ANOVA produces a main effect of group ($F(1, 69)=6.933, p<.010$), a significant interaction of verb type and group ($F(4,69)=4.872, p<.001$), which confirms that there is a different pattern seen in judgments between the two groups. In order to get a finer picture, a two-way ANOVA was conducted for each group. The ANOVA for Group 1 does not produce any main effect of verb type. Therefore, Post-hoc pairwise comparison tests within and across the verb types were not conducted. These results confirm the uneven pattern of responses across verb types by the learners group (Group1).

The ANOVA for Group 2 shows a main effect of verb type ($F(4,35)=4.544, p<.002$). Post-hoc pairwise comparison tests within and across the verb types were performed to pin down the location of the significance. The pairwise tests across the verb types show a significant difference with non-motional process verbs & involuntary reaction ($p<.039$), non-motional process verbs & emission verbs ($p<.001$), motional process & emission ($p<.001$). Unlike Group 1, the results of the ANOVA reveal that Group 2 differentiates among the verb types on the acceptability of the *kake* construction. What is interesting is that Group 2 accepts the core verbs more readily than the peripheral verbs, which contradicts the prediction of the Split Intransitive Hierarchy. If these results are credible, it would turn out that *kake* construction is not an appropriate test for split intransitivity. Further examination of Kishimoto (1996) is needed on this issue.

6.5.8.1.4 Monadic - *kake* construction-unaccusative verbs

The mean acceptability judgments of the two subject groups for unaccusative verbs are shown in Tables 6-28, 6-29 and Figures 6-19, 6-20 .

Table 6-28. Group 1:Mean acceptability judgments on unaccusative verbs with *kake*

	change of location	directed motion	change of state	appearance	pre-existing condition	concrete states	simple position	abstract state
+kake	2.37	2.41	2.41	2.34	2.43	2.30	2.44	2.24

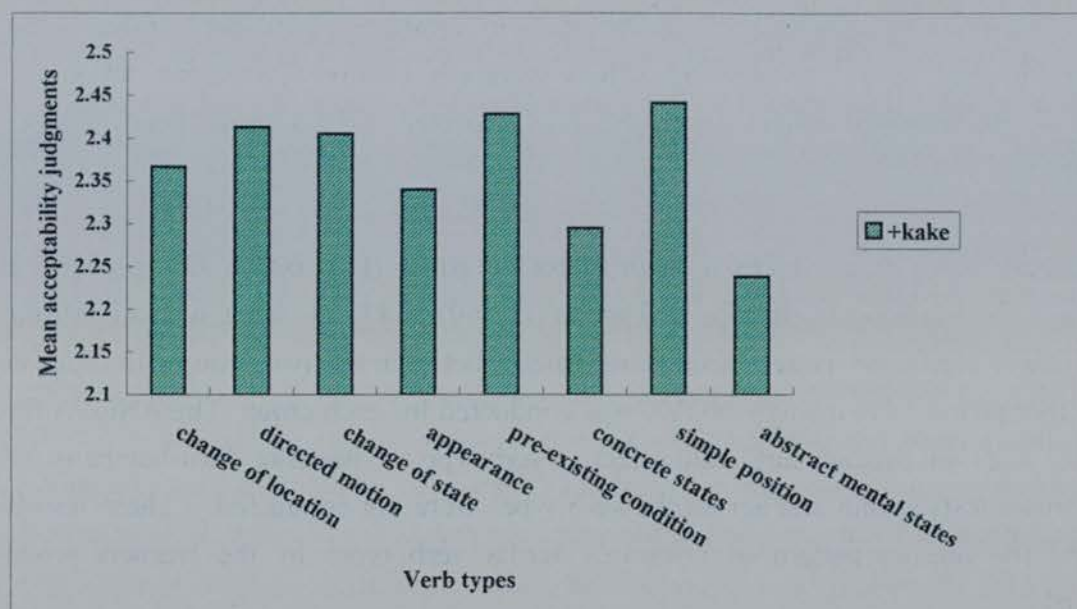


Figure 6-19. Group 1: Mean acceptability judgments on unaccusative verbs with *ake*

Table 6-29. Group 2: Mean acceptability judgments on unaccusative verbs with *ake*

	change of location	directed motion	change of state	appearance	pre-existing condition	concrete states	simple position	abstract state
+ake	1.58	2.22	2.59	1.31	1.21	0.95	1.95	1.18

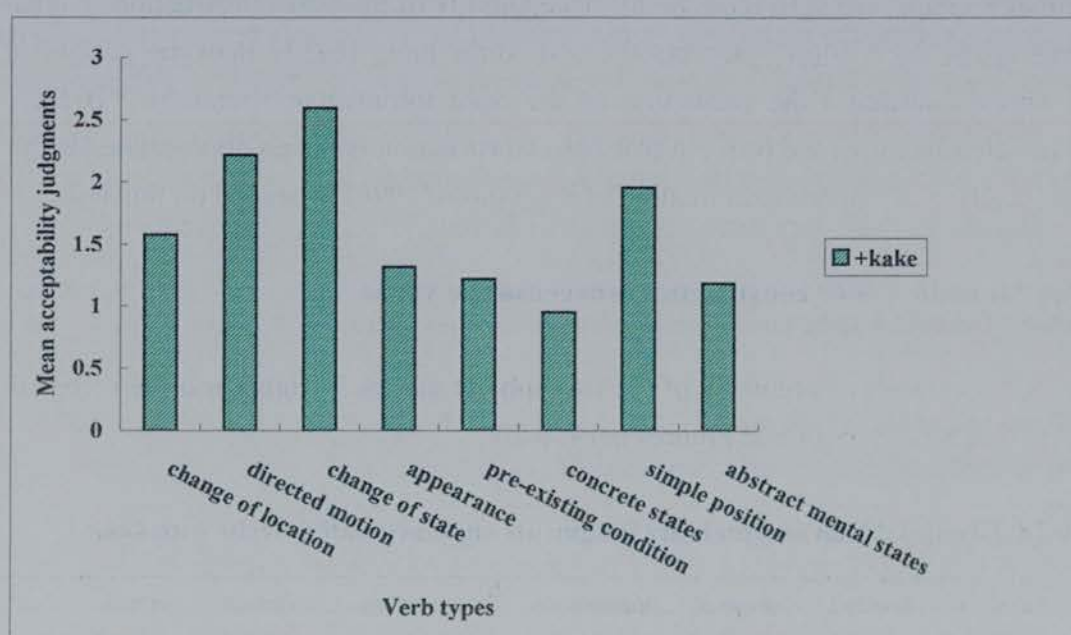


Figure 6-20. Group 2: Mean acceptability judgments on unaccusative verbs with *ake*

It appears that both Group 1 and Group 2 show an uneven pattern of responses at first glance, but there is a clear difference seen in judgments between the two groups. The native controls show impressively high acceptance of directed motion and change of state, and it is quite low for the rest of the verb types (change of location, appearance, pre-existing condition, concrete states, etc.), while the learners do not really make a distinction across the verb types of unaccusatives except for concrete states and abstract mental states whose acceptance is extremely low.

The overall ANOVA produces a main effect of verb type ($F(7,69)=24.776$, $p<.000$), a main effect of group ($F(1,69)=5.149$, $p<.026$), a significant interaction of verb type and group ($F(7,69)=18.277$, $p<.000$), which confirms that each group shows a different pattern in their judgments, and they make a clear distinction among verb types.

In order to get a finer picture, a two-way ANOVA was conducted for each group. The ANOVA for Group 1 does not show any main effect of verb type, which is consistent with our observation of the graph. Thus, Post-hoc pairwise comparison tests within and across the verb types were not performed.

The ANOVA for Group 2 shows a main effect of construction ($F(7,35)=27.259$, $p<.0001$), which confirms that Group 2 make a finer distinction across verb types with the acceptance of the *kake* construction. Post-hoc pairwise comparison tests within and across the verb types were performed to pin down the location of the significance. The pairwise tests across the verb type yield a significant difference with all the combination of the verb types except for only five pairs: directed motion verbs & change of state verbs ($p<.119$ *ns.*), appearance verbs & pre-existing condition verbs ($p<.433$ *ns.*), appearance verbs & abstract/mental state verbs ($p<.368$ *ns.*), pre-existing condition verbs & abstract/mental state ($p<.744$ *ns.*) and concrete state verbs & abstract/mental state verbs ($p<.094$ *ns.*) Overall, the results are consistent with our prediction. However, the high acceptability with simple position verbs which Group 2 displays is the sole exception, which needs further investigation.

6.5.8.1.5 Summary of findings for monadic verbs in Experiment II

The findings obtained for monadic verbs in Experiment II confirm that the judgments for monadic verbs with *takusan* construction by L2 learners and native controls are

basically conditioned by the Split Intransitivity Hierarchy. Both groups clearly differentiate between the core and peripheral verbs with the judgments for the *takusan* constructions. However, in contrast, the judgments for *kake* construction display uneven pattern in both Group 1 and Group 2. This requires reexamination of the research design.

6.5.8.2 Dyadic verbs

6.5.8.2.1 Dyadic-Sino-Japanese verbs

Tables 6-30, 6-31, and Figures 6-21, 6-22 indicate the mean acceptability judgments of the two groups on each of three different types of Sino-Japanese verb.

Table 6-30. Group 1: Mean acceptability judgments on Sino-Japanese verbs

	alternating -E&J	alternating -J only	transitive only
inchoative	2.54	2.42	2.34
transitive	2.44	2.45	2.55

Note.

alternating -E&J: Both the Sino-Japanese verb and its English equivalent allow the transitive/intransitive alternation.

alternating-J only: Only the Sino-Japanese verb allows the transitive/intransitive alternation

transitive only: Neither the Sino-Japanese verb nor its English equivalent allows the transitive/intransitive alternation

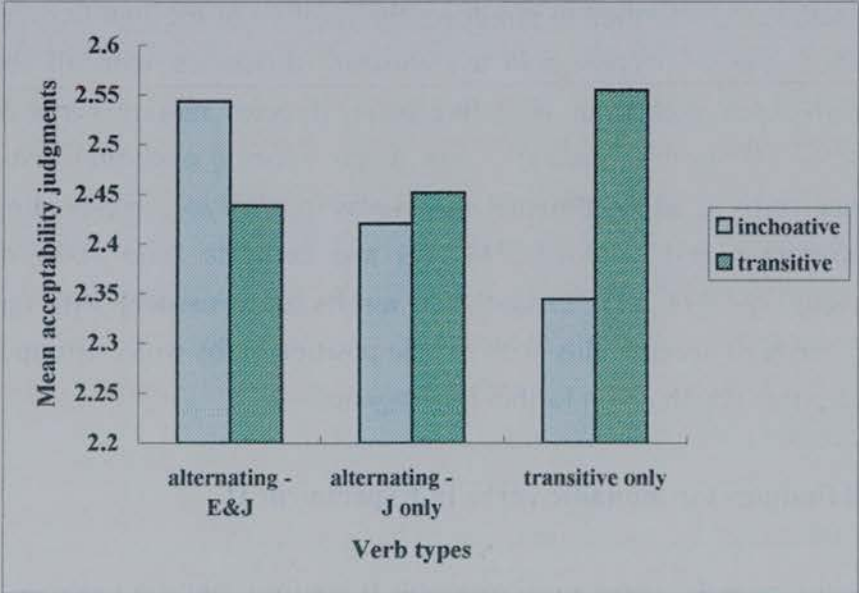


Figure 6-21. Group 1: Mean acceptability judgments on Sino-Japanese verbs

Table 6-31. Group 2: Mean acceptability judgments on Sino-Japanese verbs

	alternating –E&J	alternating –J only	transitive only
inchoative	2.39	2.43	0.90
transitive	2.65	2.73	2.50

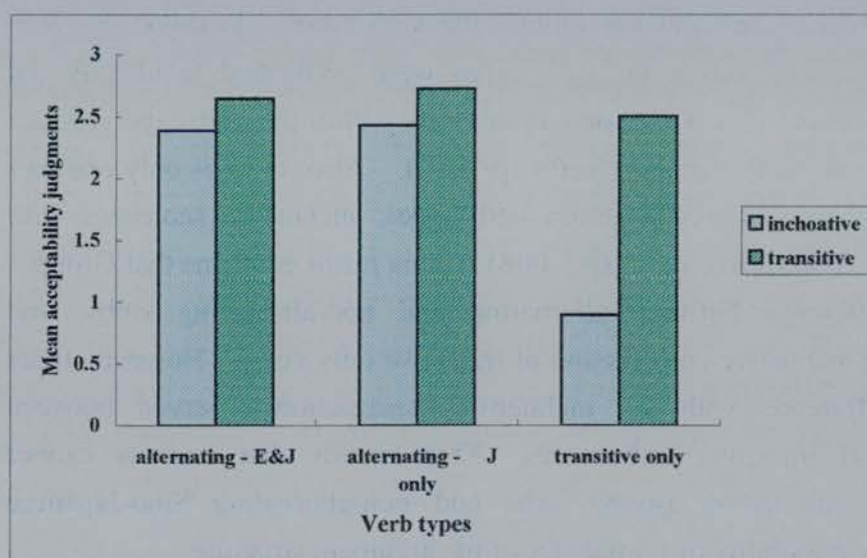


Figure 6-22. Group 2: Mean acceptability judgments on Sino-Japanese verbs

Group 1 and Group 2 appear to make a clear distinction between the inchoative and transitive construction with transitive only verbs in the same way – both groups show a strong preference for the transitive construction over the inchoative construction. However, in contrast, the two groups exhibit an opposite pattern of responses with alternating-E&J verbs – Group 1 shows a preference for the inchoative construction, but Group 2 exhibits a slight preference for the transitive construction. With respect to alternating-J only verbs, neither group really differentiates between the inchoative and transitive constructions, and treat these constructions in almost the same way.

The overall ANOVA produces a main effect of verb type ($F(2,69)=27.087, p<.0001$), a main effect of construction ($F(1,69)=47.449, p<.0001$), a significant interaction of verb type and group ($F(2,69)=25.459, p<.0001$), a significant interaction of construction and group ($F(1,69)=36.118, p<.0001$), a significant interaction of verb type and construction ($F(2,69)=42.416, p<.0001$), and a significant interaction of verb type, construction and group ($F(2,69)=20.202, p<.0001$). The overall ANOVA confirms that the two groups

perform differently with their judgments and that the testees in each group differentiate among the verb types and also between the constructions: inchoative and transitive.

A Two-way ANOVA for Group 1 yields only a significant interaction of verb type and construction ($F(2,34)=5.514$, $p<.006$). This indicates that the members of Group 1 do not really differentiate across the verb types or between the constructions, but they do exhibit different patterns of performance among the verb types. Post-hoc pairwise comparison tests within and across the verb types were performed to identify the location of the significance. Pairwise comparison tests within the verb type produce significant difference only with transitive verbs ($p<.012$). Also, there is only one pair which yields a significant difference across verb types; inchoative sentences with alternating-E&J verbs & transitive verbs ($p<.008$). This result confirms that Group 1 is aware of the difference between alternating and non-alternating verbs, and successfully reject the inchoative construction of transitive only verbs. However, there is no significant difference with the inchoative construction observed between alternating-J only and transitive only verbs. This reveals that learners cannot differentiate between alternating J-only verbs and non-alternating Sino-Japanese verbs. This leaves the possibility of L1 transfer of the argument structure.

The ANOVA for Group 2 shows a main effect of verb type ($F(2,35)=36.751$, $p<.0001$), a main effect of construction ($F(1,35)=54.241$, $p<.0001$), and a significant interaction of verb type and construction ($F(2,35)=39.347$, $p<.0001$). The results reveal that Group 2 differentiates across the verb types and also between the inchoative and transitive constructions. Post-hoc pairwise comparison tests within the verb type produce a significant difference with alternating verbs ($p<.005$), alternating-J only verbs ($p<.0001$) and transitive verbs ($p<.0001$). In Figure 6-22, it appears that there is not much difference in judgments between the two constructions, but a two way ANOVA manifests significant differences. This indicates that Group 2 differentiates between two constructions with alternating-E&J verbs and alternating-J only verbs despite the fact that these verb types allow both constructions. Pairwise comparison tests across verb types produce significant difference between inchoative constructions with alternating verbs & transitive verbs ($p<.0001$), alternating verbs-J only & transitive verbs ($p<.0001$); between transitive construction with alternating verbs & transitive verbs ($p<.014$). The results confirm that Group 2 strongly rejects the inchoative construction of transitive only verbs.

6.5.8.2.2 Dyadic-psych verbs

Tables 6-32, 6-33 and Figures 6-23, 6-24 show the mean acceptability judgments of the two groups on each of three different types of psych verb.

Table 6-32. Group 1: Mean acceptability judgments on psych verbs

	SE	UOE	COE
Group 1	2.49	2.01	2.23

Note. SE: Subject Experiencer,
UOE: Ungrammatical Object Experiencer
COE: Causative Object Experiencer

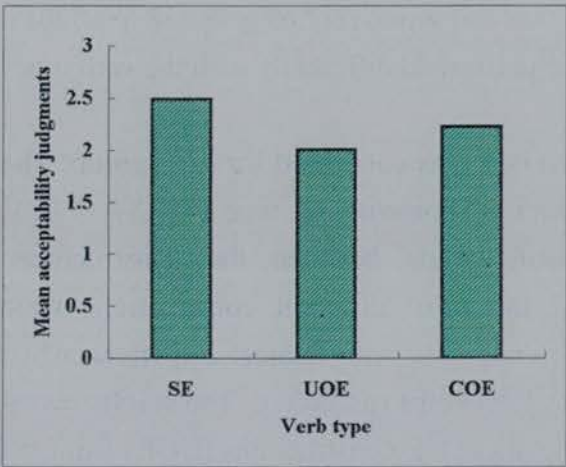


Figure 6-23. Group 1: Mean acceptability judgments on psych verbs

Table 6-33. Group 2: Mean acceptability judgments on psych verbs

	SE	UOE	COE
Group 2	2.92	0.65	2.87

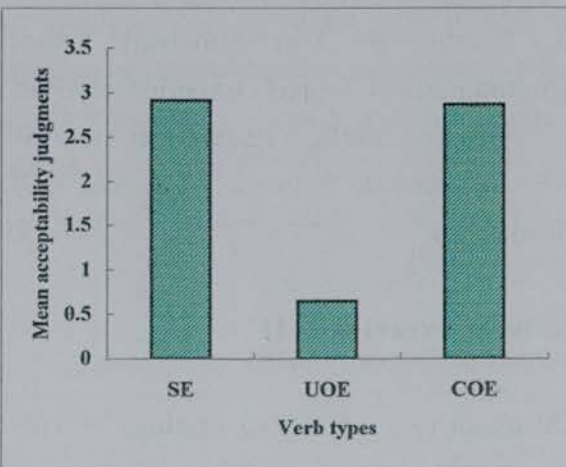


Figure 6-24. Group 2: Mean acceptability judgments on psych verbs

Group 2 shows much lower acceptance of the Ungrammatical Object Experiencer (UOE) construction, while Group 1 does not significantly distinguish UOE from other verb types. This implies the possibility of L1 influence in the judgments, because this construction is grammatical in their L1, which is English. What contradicts our prediction is that Group 1 accepts the Subject Experiencer (SE) construction slightly more than the COE construction, because the predications were made based on White (1998,1999) suggesting that English-speaking learners would accept OE verbs much more readily than the native control group does.

The overall ANOVA produces a main effect of construction type ($F(2, 69)=68.736$, $p<.0001$), a significant interaction of construction and group ($F(2,69)=36.338$, $p<.0001$), This result indicates that Group 1 and Group 2 performed differently with the verb types.

In order to get a finer picture, a two-way ANOVA was conducted for each group. The ANOVA for Group 1 produces a main effect of construction type ($F(2,34)=7.231$, $p<.001$). This confirms that learners differentiate between the constructions. Post-hoc pairwise comparison tests among the three different constructions were performed, which yields the significant difference only with Subject Experiencer(SE) verbs & Ungrammatical Object Experiencer(UOE) verbs ($p<.003$). The results reveal that learners failed to distinguish the ungrammatical OE constructions (UOE) from the grammatical ones (COE).

The ANOVA for Group 2 shows a main effect of construction type ($F(2,35)=68.819$, $p<.0001$). The results show that the native control group makes a clear distinction across the constructions. Post-hoc pairwise comparison tests across the construction types were performed to pin down the location of the significance, which showed a significant difference with Subject Experiencer(SE) verbs & Ungrammatical Object Experiencer(UOE) verbs ($p<.0001$), and Ungrammatical Object Experiencer(UOE) verbs & Causative Object Experiencer(COE) verbs ($p<.0001$). Pairwise comparison tests confirm that the native speakers clearly differentiate between UOE and COE constructions, and strongly reject the UOE construction.

6.5.8.2.3.Summary of findings for dyadic verbs in Experiment II

The results obtained for dyadic verbs brought about two interesting findings. Firstly, learners successfully differentiate between the two constructions within verb type. To

take transitive only verbs as an example, they correctly reject the inchoative construction and accept the causative construction. However, across verb types, they fail to differentiate between alternating-J only verbs and transitive only verbs. What is intriguing is that unlike the case above they manage to differentiate between alternating-E&J verbs and transitive only verbs. This lead us to the possibility of L1 influence. That is, it may be plausible to say that learners just rely on their L1 knowledge in judgments for Sino-Japanese verbs, because they cannot get any information (clue) from the morphology.

The second point is that native controls make a distinction even with the verb types which are grammatical in both constructions: inchoatives and passives. For example, with alternating -E&J verbs and alternating-J only verbs, they still exhibit a preference for the transitive construction even though these verbs types allow both constructions.

6.6 Experiment III

6.6.1 Introduction

In this section the results of Experiment III will be reported. This was motivated by the findings of Experiment II. Experiment II did not test dyadic verbs, but exclusively monadic verbs embedded in the *kake* and *takusan* constructions. In the process of analyzing the data from Experiment II, a few more issues to be investigated had arisen with each construction. First, the tests on the *kake* construction in Experiment II has been designed based on Kishimoto's (1996) analysis, but after the administration of Experiment II, Tsujimura and Ida (1999) was published claiming a different view on the interpretation of the *kake* construction (see section 3.1.6 for the detailed discussion). In short, Tsujimura and Ida's claim is that the interpretation of the *kake* construction should be differentiated between two different readings: the "halfway" reading and the "inception" reading, while Kishimoto (1996) does not distinguish between the two readings. Since Experiment II employed Kishimoto's (1996) analysis and simply asked the informants to make judgments on whether it is acceptable or not, the results could never reveal which reading the subjects had in mind for the judgment. Thus, it was decided to administer a new experiment with a control for the distinction between the two readings.

Secondly, with respect to the *takusan* construction, it turned out that the picture cued task used in Experiment II was problematic in not distinguishing between the "frequency of action" and "continuation of action". In order to see whether learners are able to distinguish between the two readings, it is crucial that the cue (trigger) clearly and accurately describes the situation so that informants never have a wrong context in their mind. Thus, it was decided to conduct Experiment III employing a translation test.

Finally, the results of Experiment I and Experiment II raised a very important issue in the application of the Split Intransitivity Hierarchy to Japanese. This is that Japanese does not really have finer distinctions within Stative verbs in the periphery of unaccusativity such as "Existence of condition-concrete states", "Existence of condition-simple position" an "Existence of condition-abstract/mental state" as in European languages. Thus, the decision was made that these three verb types would not be tested in Experiment III. These three points motivated this study. The description of Experiment III follows.

First, details of methodology, including hypotheses, participants, materials, design, and procedure, will be described. Then, an inferential analysis will be provided.

6.6.2 Questions to be addressed

1. Will L2 learners be aware of the two different readings of *takusan* and *kake* constructions, which are associated with the lexical-semantic features of split intransitivity and aspectual properties, respectively?
2. Will L2 learners of Japanese display a different sensitivity to the unaccusative-unergative distinction depending on the position of monadic verbs on the Split Intransitivity?

6.6.3 Hypotheses

Based on the findings from Experiment II, the following hypotheses are formulated:

1. Learners would be less determinate with peripheral verbs than with core verbs in making a distinction between two different readings of the *takusan* construction.
2. Learners would show a stronger preference for the inception reading “be about to” over the “half way” reading of the *kake* construction, because of its wider applicability to the verbs.

6.6.4 Participants

A total of 42 participants took part in the study: a group of 22 adult native speakers of English who studied at the University of Edinburgh and the University of Stirling, and 20 native speakers of Japanese who were studying at the University of Edinburgh (controls). The age of the learners' group ranged from 20 to 26, and all of them had spent more than six months study in Japan after learning Japanese in a school setting for more than two years. They had started learning Japanese as adults and had hardly had any exposure to Japanese outside the classroom setting before they went to study in Japan.

Prior to the main session, all the participants took a cloze test and a vocabulary test in order to make sure that there was a common basis among the learners. The cloze test was made out of a passage of about 50 words, by eliminating every ninth word, leaving

six blanks. Multiple choices were given as suggested completions for each blank. Ten verbs were used in the vocabulary test. The participants were asked to connect each Japanese verb to the matching meaning provided in English by drawing a line between them. The results of the preliminary tests are presented in Table 6-34.

Table 6-34: Results of the cloze test and vocabulary test

Group	cloze test		vocabulary test	
	Mean	SD	Mean	SD
group 1(N=22)	2.09	1.87	8.41	3.53

It turned out that the mean score of the cloze test was not so high as predicted from their background, but the results of the vocabulary test confirm that their proficiency level is high enough to take the main test, and also that they are familiar with the lexical items chosen for the main test.

6.6.5 Materials

As referred to in the Introduction, Experiment III was designed by taking into account some problems which were found in Experiment I and Experiment II. The same two properties as those in Experiment II, *takusan* and *kake* constructions were tested in Experiment III. The instrument employed for this study was a preference test, since what we wanted to establish was which reading would be preferred between the two readings of each construction. The preference task is appropriate to give a clear indication of learners' preference.

All the sentences presented are grammatically correct, but what they were asked to do is to choose the more suitable meaning for each item. This is the reason why the means of measurement available for the analysis of this study is limited. The data is qualitative, which can be measured as nominal data but not by ratio scale.

Experiment III was designed to give answers to the questions which arose out of Experiment II. Thus, the same two properties, *takusan* and *kake* were tested using the technique of a preference test. The picture judgment task and Magnitude Estimation task used in Experiment II were not employed for Experiment II, because it was difficult to pin down the difference between the two readings of each construction.

6.6.5.1 *takusan* construction

In Experiment II, one verb from each of 13 verb types on the Split Intransitivity Hierarchy was employed for the picture judgment test. However, the verbs in the last three verb types of unaccusatives were abandoned from the target items in this study, because the scrutiny of the test sentences of the data in Experiment II revealed that these three verb types are basically incompatible with the adverb “*takusan*”. Thus, a total of ten verbs were chosen for the test as follows:

Table 6-35 : List of Verb in the Preference test

<Unergative>	
Controlled non-motional process:	<i>utau</i> ‘sing’, <i>asobu</i> ‘play’, <i>matu</i> ‘wait’
Controlled motional process:	<i>oyogu</i> ‘swim’, <i>aruku</i> ‘walk’, <i>hasiru</i> ‘run’
Uncontrolled process-bodily function:	<i>haku</i> ‘vomit’, <i>hurueru</i> ‘shiver’, <i>asebamu</i> ‘sweat’
Uncontrolled process-involuntary reaction:	<i>hurueru</i> ‘shiver’, <i>yureru</i> ‘tremble’, <i>guratuku</i> ‘waver’
Uncontrolled process-emission:	<i>hikaru</i> ‘flash’, <i>kagayaku</i> ‘shine’, <i>niou</i> ‘smell’
<Unaccusative>	
Change of location:	<i>tuku</i> ‘arrive’, <i>kuru</i> ‘come’, <i>saru</i> ‘leave’
Change of condition-directed motion:	<i>noboru</i> ‘ascend’, <i>susumu</i> ‘advance’, <i>agaru</i> ‘rise’
Change of condition-change of state:	<i>kusaru</i> ‘rot’, <i>kutiru</i> ‘decay’, <i>sioreru</i> ‘wilt’
Change of condition-appearance:	<i>arawareru</i> ‘appear’, <i>okoru</i> ‘happen’, <i>syoziru</i> ‘arise’
Condition of pre-existing condition:	<i>todomaru</i> ‘stay’, <i>tuduku</i> ‘continue’, <i>nokoru</i> ‘remain’

Recall that *takusan* (a lot) is realized within the VP and only modifies the internal argument of the verb. Since an unaccusative sentence such as (286a) has an internal argument to be modified by *takusan*, the subject “people” is quantified by *takusan* (a lot). In contrast, an unergative sentence such as (286b) does not have an internal argument, therefore *takusan* just expresses the frequency of action which is inherently denoted.

- (286) a. *Takusan tui-ta*
 a lot arrive-PAST
 “A lot of people arrived”
 b. *Takusan ason-da*
 a lot play-PAST
 “he/she/we/they played a lot”

Each test sentence with “*takusan*” was presented in Japanese, followed by a pair of translations in English. Unlike Experiment II, prior to the test sentence, one sentence

simply describing the context was provided in English so as to make sure that all the participants assume the same context. The participants were asked to indicate whether both sentences were correct, only one is correct, or both were incorrect by choosing one among the choices, as presented in the following example.

(287) Unergative

-This sentence is about RUNNERS-

Takusan hasitta

a. A lot of runners ran.

b. A runner ran a lot.

only a is right only b is right both right both wrong

(288) Unaccusative

-This sentence is about FRUITS-

Takusan kusatta

a. A lot of fruits rotted.

b. A fruit rotted a lot.

only a is right only b is right both right both wrong

Since the unergative sentence (287) does not have an internal argument to be modified by *takusan*, it just received an adverbial reading, which expresses the frequency of action. Thus, only *b* is right. In contrast, unaccusatives such as (288) have an internal argument to be manifested by *takusan*, and the subject “fruit” is quantified by *takusan* “a lot”. Thus only *a* is right.

6.6.5.2 *kake* construction

Since Experiment II employed Kishimoto’s (1996) analysis, the difference in the interactions of the *kake* construction was not focused on. The acceptability of the sentences with the *kake* construction was tested without attempting to control for the distinction between the two readings. Therefore the results could not indicate which reading the subject had in mind when they judged the sentence. Based on the evaluation of Experiment II, it was decided that Tsujimura and Iida’s (1999) analysis should be employed for Experiment III. Recall that unlike Kishimoto (1996), Tsujimura and Iida (1999) differentiate the interpretation of the *kake* construction between the two different readings: the “halfway” reading and the inception reading

(see section 3.1.6 for details) Since the main focus of this study was to see whether learners distinguish the two different interpretations associated with the verbs' aspectual properties, the translation task was employed in the form of the preference task. The examples are as follows:

(289) unergative

hanasi-kake-no sikaisya

- a. A chairperson, halfway talking
- b. A chairperson who is about to talk

only a is right only b is right both right both wrong

(290) unaccusative

taore-kake-no ki

- a. A tree, halfway falling
- b. A tree which is about to fall

only a is right only b is right both right both wrong

Like with the *takusan* construction, the participants were asked to indicate whether both sentences were correct, or only one is correct, or both were incorrect by choosing one among the four responses. Recall that Tsujimura and Ida (1999) claim that the inception reading "be about to" is possible with any verb, while the *halfway* reading is possible only with verbs denoting (non-punctual) telicity as shown in Table 6-36.

Table 6-36: The summary of Tsujimura and Iida's analysis

	Telic		Atelic	
	Achievement	Accomplishment	Activity	Stative
Halfway reading	NO	OK	OK NO	NO
Inception reading	OK	OK	OK	OK

(Tsujimura and Iida 1999:127)

However, it seems that the degree of compatibility with the inception reading still differ among verb classes. For example, verbs which denote "indefinite change" (Sorace 2000:864) such as verbs of directed motion (*hieru* "cool", *agaru* "rise") and change of state (*kusaru* "rot", *sioreru* "wilt") are assumed not to receive the inception reading as readily as other unaccusative verbs, because these verb classes do not imply either

definite starting point or definite end point. This is one of the issues which needs to be carefully examined when looking at the native data.

There were 20 sentences involving the *kake* construction. Two verbs from each verb type on the Split Intransitive Hierarchy were employed. The verbs employed are presented in Table 6-35 above.

6.6.6 Procedures

The administration of the test was done by post, because of constraints on the availability of native speakers of English who had spent more than one year in Japan. In the letter to explain the purpose, they were told not to consult a native speaker or a dictionary. However, it does not appear that there are any problems with this self-administered style. The main reason for making this point stems from the characteristics of the task and materials. In the first place, this is not a test to measure the participants proficiency. Second, needless to say, it is obvious that the different interpretations of *kake* and *takusan* depending on the verb which they occur with is something quite remote from what they learn from a reference book or classroom instruction, even though they had been exposed to the phrases in daily conversation. That is, they have no chance to get any meta-linguistic instruction about the semantic differences between those constructions— they only learn about it from daily exposure to the language. In addition, preference between readings would vary across the peripheral verbs in the hierarchy even among native speakers. Taking these facts into account, it would not seem to be of any help to consult a dictionary or native speakers. All the materials sent to the participants were:

- (a) a letter to describe the purpose of the experiment and to ask for their cooperation.
- (b) questionnaire on background information
- (c) the cloze and the vocabulary test
- (d) the main test
- (e) an answer sheet

The participants received instructions to start with the cloze and vocabulary tests, and to move on to the main test. In the main test, they were asked to make their own judgments at a consistent pace without too much thinking over and without spending too long for each item. It was also requested that they should not return it to a

previous item in the test. After completing the test, the participants were asked to return in an enclosed pre-addressed stamped envelope.

6.6.7 Analysis

First, the frequency of each response was calculated by adding the number of times the choice was preferred by learners. Then only the response scores which are crucial to the research question were extracted, and a two way-repeated measures ANOVA was performed on the unaccusative and unergative sentences separately. For example, in the analysis of the *takusan* construction, the score of “only *b* is right”(adverb reading) is the correct response for unergatives, while the score of “only *a* is right” (quantified NP reading) is the correct response for unaccusatives, so these choices were targeted for ANOVA. The choices, “both right” and “both wrong” were not included in the analysis, for neither is the correct answer.

However, the situation is not so straightforward for the *kake* construction. Recalling Table 6-36 extracted from Tsujimura and Ida (1999), only a subset of unaccusatives allow the halfway reading along with the inception reading, which is available with any verb. That is, the correct response is supposed to distinguish between “both right” (the *halfway* and the inception readings) or “only *b* is right” (the inception reading) depending on the verb’s properties: unergatives do not exhibit optionality between the *halfway* reading and the inception reading, but only allow the “inception” reading. Thus, the category “only *b* is right” was chosen as the target for performing ANOVA, because it seems to be simpler to focus on the negation of kind of “marked” *halfway* reading than focusing on the acceptance of the reading, and adding the scores of two categories such as “only *a* is right” and “both right”.

The main focus of the analysis is to see whether the learners accept the *inception* reading and reject the *halfway* reading with unergative verbs and a subset of unaccusative verbs. Thus, as far as unergatives are concerned, the case is easy and clear, but with respect to unaccusatives, it is more complicated. For example, if the score of “only *b* is right” is high, it indicates that the learners were able to select the correct reading for the *kake* construction with unergative verbs. In contrast, it is difficult to be certain about unaccusatives without further analysis of the results, because “only *b* is right” is correct with only a subset of verbs, and there still remain some possibilities that the *halfway* reading is wrongly rejected with some unaccusative

verbs. Here is the summary.

Table 6-37: The summary of correct responses for each construction

< takusan >		unergative	unaccusative	
	a.qualified NP	*	OK	
	b.adverb	OK	*	
		only <i>b</i> is right	only <i>a</i> is right	

< kake >		unergative	unaccusative	
	a.halfway	*	*	OK
	b.inception	OK	OK	OK
		only <i>b</i> is right	only <i>b</i> is right	both right

6.6.8 Results of Experiment III

6.6.8.1 The *takusan* construction

6.6.8.1.1 Results

The mean scores of the two groups of unergatives and unaccusatives are presented in Tables 6-38, 6-39 and Figure 6-25 for Group 1(Ls) and Tables 6-40, 6-41 and Figure 6-26 for Group 2 (NSs).

Table 6-38. Group 1: Frequency Distribution of Scores for unergatives: *takusan*

	non-motional process	motional process	bodily function	involuntary reaction	emission
only <i>a</i> is right	8 (18.2%)	12 (27.3%)	6 (13.6%)	17 (38.6%)	22 (50%)
only <i>b</i> is right	18 (40.9%)	15 (34.1%)	21 (47.7%)	15 (34.1%)	3 (6.8%)
both right	18 (40.9%)	17 (38.6%)	17 (38.6%)	11 (25.0%)	19 (43.2%)
both wrong	0 (0%)	0 (0%)	0 (0%)	1 (2.3%)	0 (0%)

Table 6-39. Group 1: Frequency Distribution of Scores for unaccusatives: *takusan*

	pre-existing condition	appearance	change of state	directed motion	change of location
only <i>a</i> is right	29 (65.9%)	30 (68.2%)	24 (54.5%)	25 (56.8%)	30 (68.2%)
only <i>b</i> is right	8 (18.2%)	5 (11.4%)	15 (34.1%)	7 (15.9%)	4 (9.1%)
both right	1 (2.3%)	9 (20.5%)	5 (11.4%)	11(25.0%)	10 (22.7%)
both wrong	6 (13.6%)	0 (0%)	0 (0%)	1 (2.3%)	0(0%)

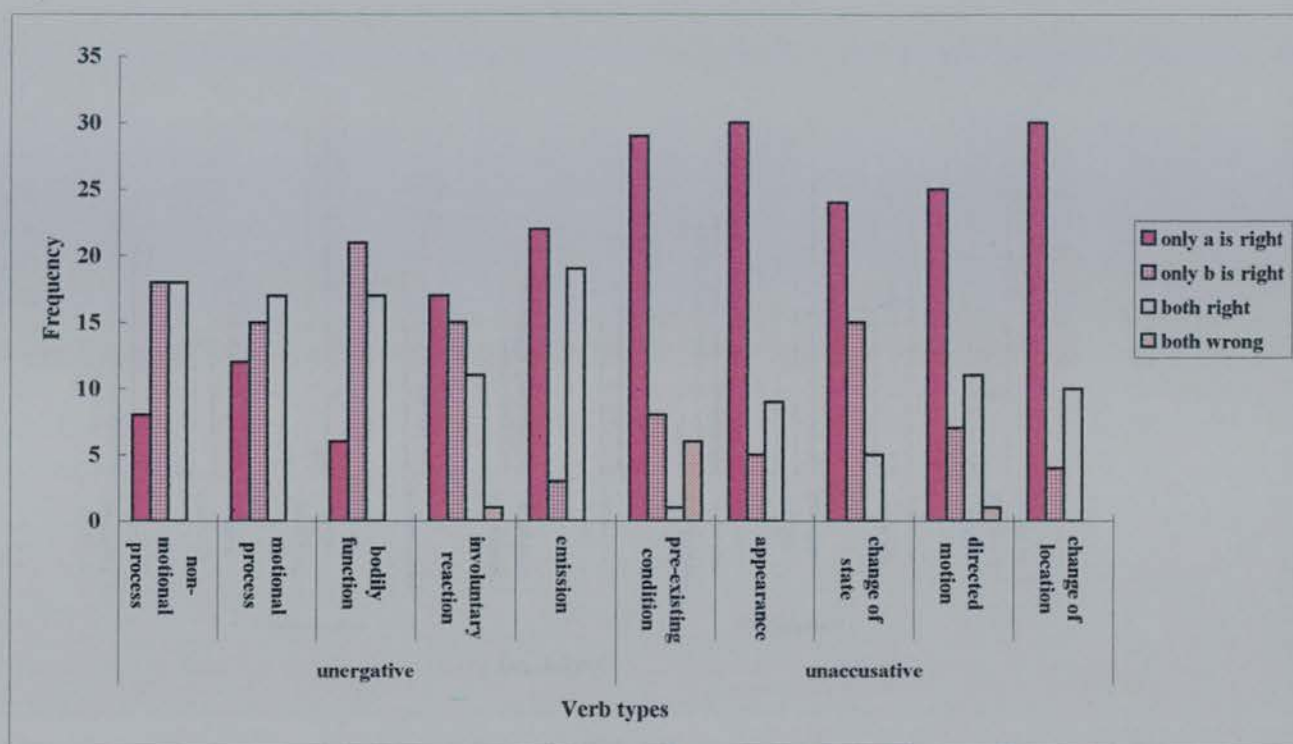


Figure 6-25. Group 1: Frequency Distribution of Scores: *takusan*

Table 6-40. Group 2: Frequency Distribution of Scores for unergatives: *takusan*

	non-motional process	motional process	bodily function	involuntary reaction	emission
only a is right	0 (0%)	0 (0%)	1 (2.5%)	8 (20.0%)	15 (37.5%)
only b is right	33 (82.5%)	25 (62.5%)	30 (75.0%)	23 (57.5%)	8 (20.0%)
both right	7 (17.5%)	15 (37.5%)	9 (22.5%)	5 (12.5%)	16 (40.0%)
both wrong	0 (0%)	0 (0%)	0 (0%)	4 (10.0%)	1 (2.5%)

Table 6-41. Group 2: Frequency Distribution of Scores for unaccusatives: *takusan*

	pre-existing condition	appearance	change of state	directed motion	change of location
only a is right	17 (42.5%)	27 (67.5%)	34 (85.0%)	18 (45.0%)	24 (60.0%)
only b is right	12 (30.0%)	0 (0%)	2 (5%)	5 (12.5%)	5 (12.5%)
both right	6 (15.0%)	13 (32.5%)	3 (7.5%)	12 (30.0%)	10 (25.0%)
both wrong	5 (12.5%)	0 (0%)	1 (2.5%)	5 (12.5%)	1 (2.5%)

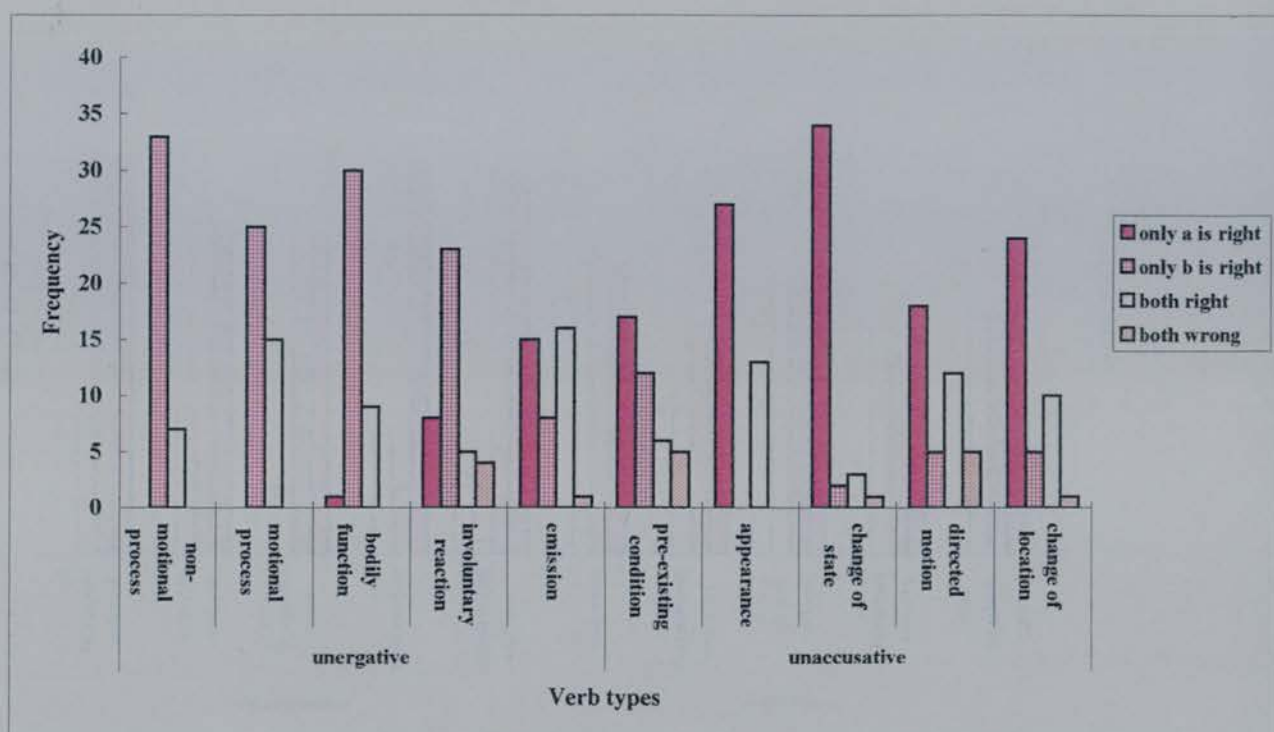


Figure 6-26. Group 2: Frequency Distribution of Scores: *takusan*

The results of *takusan* were very close to our prediction. There is a clear difference in responses between Group 1 and Group 2. Overall, the table of frequency distribution of scores shows that Group 2 clearly differentiates between unergatives and unaccusatives: they accept *b* (adverb reading) and reject *a* (quantified NP reading) for unergatives, while they accept *a* (quantified NP reading) and reject *b* (adverb reading) for unaccusatives. Looking at the results within each verb category, what is notable is that the responses by Group 2 display more variety for the peripheral verb types such as “emission” and “involuntary” reaction. This is the case for the peripheral unaccusative verbs. These responses differ among four choices with “pre-existing condition” verbs. The results show some interesting data about unaccusatives: native speakers of Japanese accept *a* (quantified NP reading) with “change of state” and “appearance” verbs much more than the core verb types such as “change of location” or “directed motion” verbs.

In contrast, Group 1 does not really distinguish between unergatives and unaccusatives as clearly as Group 2 does. With unergative verbs, their responses display some variations among four choices despite the fact that it is core or peripheral verbs. Interestingly, learners’ responses show less variations and they are more consistent across the verb types for unaccusatives in accepting *a* (quantified NP reading).

a. ANOVA for unergatives

An overall ANOVA produces a main effect of verb type ($F(4,40)=21.674$, $p<.0001$), a main effect of group ($F(1,40)=10.528$, $p<.002$), but does not yield any significant interaction of verb type and group ($F(4,40)=1.463$, $p<.216$ ns), which reveals that the two groups perform differently regardless of verb type.

In order to get a finer picture, one-way ANOVA was conducted for each group. The ANOVA for Group 1 shows a main effect of verb type ($F(4,21)=7.875$, $p<.0001$). The results confirm that Group 1 significantly differentiated across verb types. Post-hoc pairwise comparison tests across the verb types were performed to pin down the location of the significance. Pairwise comparison tests across the verb type yield a significant difference between non-motional process verbs & emission verbs ($p<.001$), motional process verbs & bodily function verbs ($p<.030$), motional process verbs & emission verbs ($p<.004$), bodily function & emission verbs ($p<.0001$), and involuntary reaction & emission verbs ($p<.0001$). The results support the prediction of the Split Intransitivity Hierarchy: learners treat the verb differently between the core verbs and the peripheral verbs—they consider the core verbs more unergative than the peripheral verbs by accepting *a* (quantified NP reading), which is allowed only for unergatives.

The ANOVA for Group 2 produces a main effect of verb type ($F(4,19)=14.096$, $p<.0001$). These results also bear out that Group 2 clearly differentiates across the verb types. Pairwise comparison tests across the verb type yield a significant difference between non-motional process verbs & motional process verbs ($p<.008$), non-motional verbs & involuntary reaction verbs ($p<.014$), non-motional process verbs & emission verbs ($p<.0001$), motional process verbs & emission verbs ($p<.0001$), bodily function & emission verbs ($p<.0001$), and involuntary reaction & emission verbs ($p<.0001$). The prediction of the Split Intransitive Hierarchy is supported by the performance of Group 2. The difference of acceptability between the core verb types and the peripheral verb types is identified more significantly than that found in Group 1. A significant difference is found even with core verbs such as non-motional process and motional process verbs, which reveals that Group 2 makes finer distinctions among verb types.

b. ANOVA for unaccusatives

An overall ANOVA yields a main effect of verb type ($F(4,40)=3.075$, $p<.018$), a significant interaction of verb type and group ($F(4,40)=4.507$, $p<.002$), which confirms that each group shows a similar pattern in their judgments across verb types.

A one-way ANOVA for Group 1 does not produce a main effect of verb type ($F(4,21)=1.013$, $p<.406$ ns). As observed in the graph, the ANOVA results reveal that Group 1 does not really differentiate among verb types. Furthermore Pairwise comparison tests were performed across verb types so as to make sure the ANOVA data never yield significant differences with any combinations of verb types, which confirms that Group 1 does not differentiate one of the types of unaccusative verb in terms of the reading of the *takusan* construction.

In contrast, the ANOVA for Group 2 produces a main effect of verb type in their judgments across verb types. Pairwise comparison tests across the verb type yield a significant difference between change of location verbs & change of state verbs ($p<.021$), directed motion verbs & change of state verbs ($p<.001$), directed motion & appearance verbs ($p<.035$), change of state verbs & pre-existing verbs ($p<.001$), and appearance verb & pre-existing verbs ($p<.038$). The results do not really show any gradient effect along the Split Intransitivity Hierarchy, which is a little contrary to the prediction. This deserves further consideration.

6.6.8.1.2 Summary of findings for *takusan* construction in Experiment III

The findings obtained for the *takusan* construction support our prediction of the Split Intransitivity Hierarchy. In particular, the native controls show a clear difference in the preference between unaccusatives and unergatives—they accept the "adverb" reading for unergatives and the "quantified NP" reading for unaccusatives. This trend is also observed in the responses of Group 1, though it is not as distinctive as Group 2.

Within each of the verb categories: unergative and unaccusative, Group 2 displays a finer distinction among verb types and exhibits some gradient effects. This phenomenon is more prominent with unergative verbs. For instance, the learners' responses vary among four choices with "emission" verbs, while their responses are very determinate with "non-motional" verbs—most of the participants select the "a lot" reading except for a few people choosing "both right".

In contrast, the responses by Group 1 show some variation among four choices only except for "change of location", "appearance" and "pre-existing condition", where a clear preference for the "subject" reading is found.

6.6.8.2 The *kake* construction

6.6.8.2.1 Results

The mean scores of the two groups of unergatives and unaccusatives are presented in Tables 6-42, 6-43, Figures 6-27 for Groups 1, and Tables 6-44, 6-45, Figures 6-28 for Group 2.

Table 6-42. Group 1: Frequency Distribution of Scores for unergatives: *kake*

	non-motional process	motional process	bodily function	involuntary reaction	emission
only a is right	19 (43.2%)	12 (27.3%)	16 (36.4%)	17 (38.6%)	17 (38.6%)
only b is right	19 (43.2%)	24 (54.5%)	16 (36.4%)	17 (38.6%)	13 (29.5%)
both right	3 (6.8%)	7 (15.9%)	11 (25.0%)	6 (13.6%)	7 (15.9%)
both wrong	3 (6.8%)	1 (2.3%)	1 (2.3%)	4 (9.1%)	7 (15.9%)

Table 6-43. Group 1: Frequency Distribution of Scores for unaccusatives: *kake*

	pre-existing condition	appearance	change of state	directed motion	change of location
only a is right	12 (27.3%)	11 (25.0%)	23 (47.7%)	23 (52.3%)	17 (38.6%)
only b is right	13 (29.5%)	24 (54.5%)	10 (22.7%)	10 (22.7%)	14 (31.8%)
both right	7 (15.9%)	3 (6.8%)	9 (20.5%)	8 (18.2%)	6 (13.6%)
both wrong	12 (27.3%)	6 (13.6%)	4 (9.1%)	3 (6.8%)	7 (15.9%)

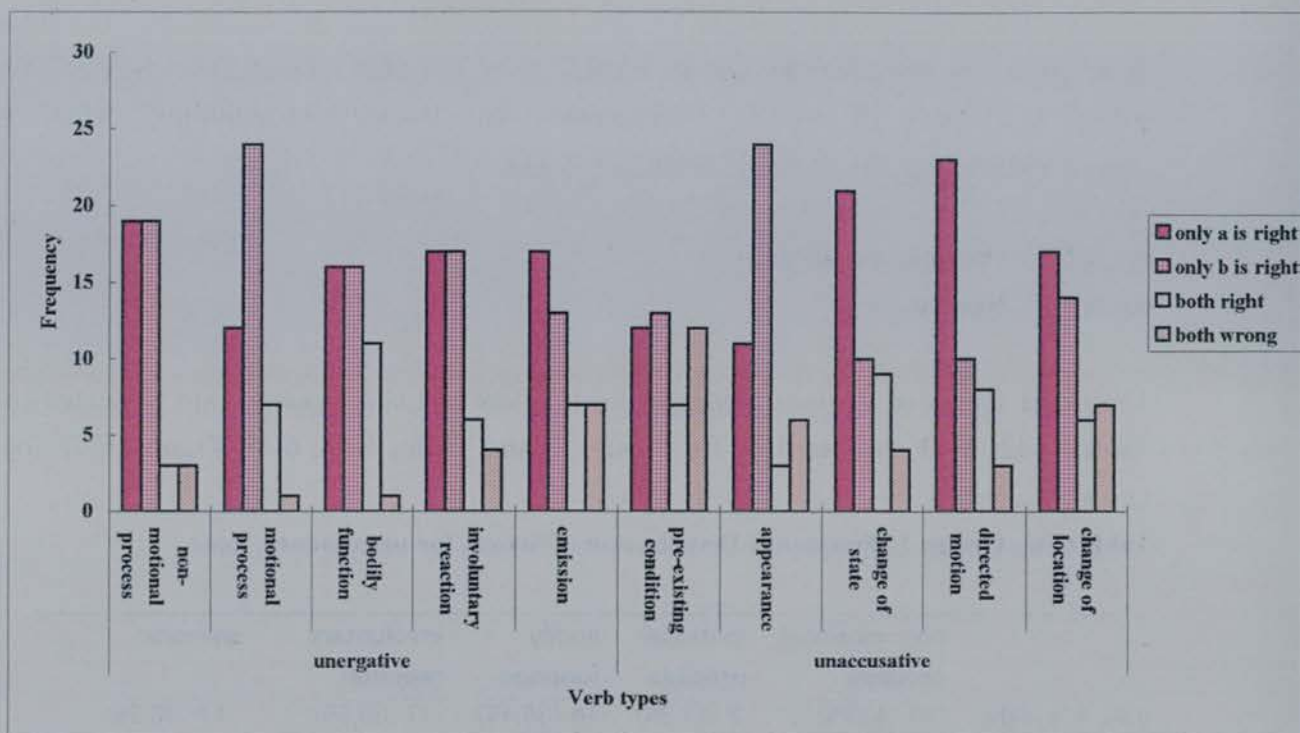


Figure 6-27. Group 1: Frequency Distribution of Scores: *kake*

Table 6-44. Group 2: Frequency Distribution of Scores for unergatives: *kake*

	non-motional process	motional process	bodily function	involuntary reaction	emission
only a is right	16 (40%)	7 (17.5%)	6 (15.0%)	12 (30.0%)	12 (30.0%)
only b is right	16 (40%)	21 (52.5%)	28 (70.0%)	18 (45.0%)	15 (37.5%)
both right	4 (10%)	7 (17.5%)	2 (5.0%)	6 (15.0%)	4 (10.0%)
both wrong	4 (10%)	5 (12.5%)	4 (10.0%)	4 (10.0%)	9 (22.5%)

Table 6-45. Group 2: Frequency Distribution of Scores for unaccusatives: *kake*

	pre-existing condition	appearance	change of state	directed motion	change of location
only a is right	12 (30.0%)	10 (25.6%)	27 (67.5%)	14 (35.0%)	21 (52.5%)
only b is right	12 (30.0%)	19 (48.7%)	7 (17.5%)	9 (22.5%)	5 (12.5%)
both right	2 (5.0%)	3 (7.7%)	6 (15.0%)	14 (35.0%)	12 (30.0%)
both wrong	14 (35.0%)	7 (17.9%)	0 (0%)	3 (7.5%)	2 (5.0%)

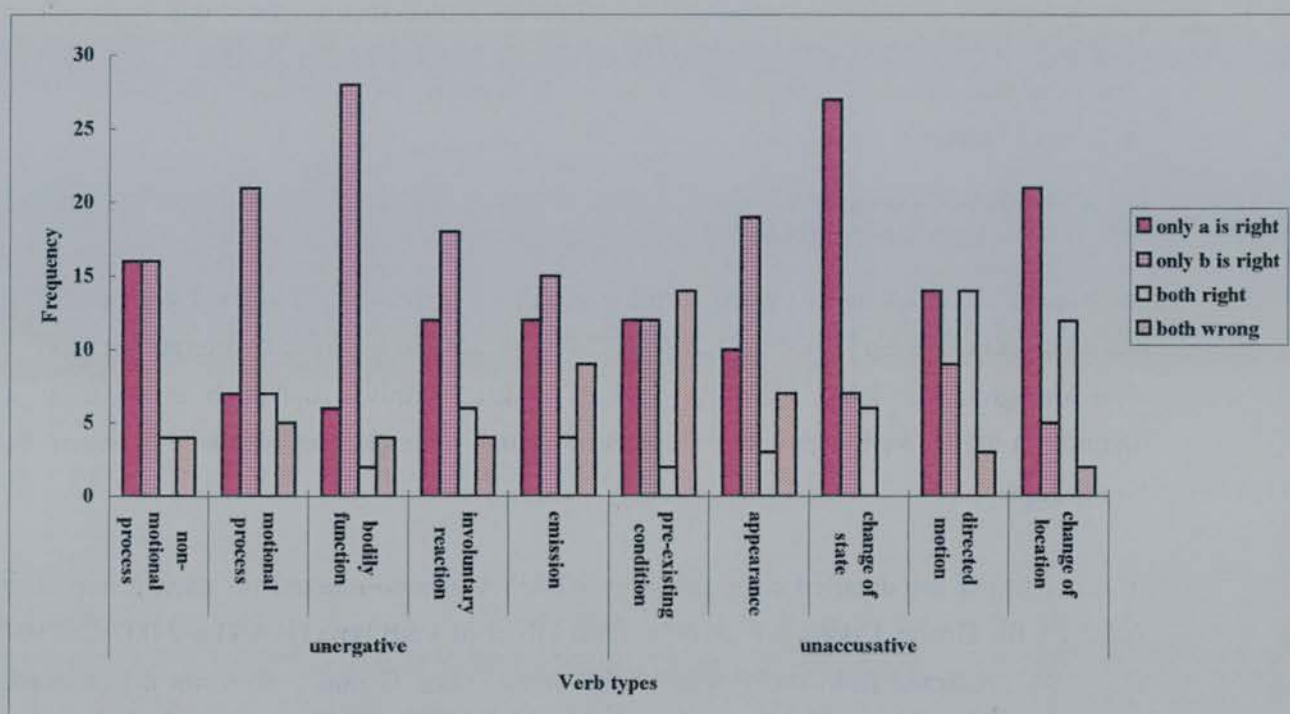


Figure 6-28. Group 2: Frequency Distribution of Scores: *kake*

Overall, the results of the *kake* construction are slightly more complicated than for *takusan*. In comparison between the learners (Group 1) and the native controls (Group 2), Group 2 exhibits different patterns of responses between unergatives and unaccusatives: they show a preference for the *inception* reading over the *halfway* reading for unergative verbs, while they accept the *halfway* reading more than the *inception* reading with unaccusatives. These results confirm that Group 2 clearly differentiates between these two verb categories. To look more closely into the results for each verb category, what is notable with unaccusatives is that the native controls show a preference for the *halfway* reading over the *inception* reading, which contradicts Kishimoto's and Tsujimura and Ida's (1999) claim that verbs which denote punctual telicity never allow the *halfway* reading, because the reading requires some time span denoted by the verb. This issue needs to be examined further.

In contrast, it is quite hard to characterise the pattern of responses by Group 1 between unergative and unaccusative verbs, because they just exhibit an uneven pattern of responses. Their responses display great (some) variation among the four choices and it is hard to generalize from them. The learners (Group 1) show a determinate (strong) preference only with a few verb types: a preference for the *inception* reading with

motional process verbs and appearance verbs, and a preference for the halfway reading with directed motiona verbs and change of state verbs, which are overall parallel to the results of Group 2.

b. ANOVA for unergatives

An overall ANOVA barely yields a main effect of verb type ($F(4,40)=2.444$, $p<.049$), but no effect of group ($F(1,40)=1.386$, $p<.246$ ns), and no significant interaction of verb type and group ($F(4,40)=1.846$, $p<.123$ ns), which implies that each group make a distinction across verb types, but there is not much difference in response between the two groups.

In order to get the detailed data, one-way ANOVA was conducted for each group. The ANOVA for Group 1 does not show a main effect of verb type ($F(4,21)=2.007$, $p<.101$ ns.). As predicted from the graphs of the mean score, Group 1 does not differentiate among verb types in the inception reading. Similary, the ANOVA for Group 2 does not produce a main effect of verb type ($F(4,19)=2.137$, $p<.084$). These results are rather contrary to what was predicted. The graph displays differences among verb types, but the ANOVA does not yield any significant difference. These results are inconsistent and needs further examination.

b. ANOVA for unaccusative

An overall ANOVA produces a main effect of verb type ($F(4,40)=7.051$, $p<.001$), but no main effect of group ($F(1,40)=.715$, $p<.403$ ns), or any significant interaction of verb type and group ($F(4,40)=.686$, $p<.603$ ns), which is a similar pattern to that of unergatives. It can be interpreted that each group differentiated across verb types, but there is not much difference in responses between the two groups.

A one way ANOVA for Group 1 yields a main effect of verb type ($F(4,21)=4.533$, $p<.002$). Contrary to our impression from the graph of mean scores, the ANOVA reveals that Group 1 makes a distinction across the verb types. Post-hoc pairwise comparison tests across the verb types were performed to pin down the location of the significance. Pairwise comparison tests across the verb type produce a significant difference between change of location verbs & appearance verbs ($p<.029$), directed motion verbs & appearance ($p<.005$), change of state verbs & appearance verbs ($p<.005$), and appearance verbs & pre-existing verbs ($p<.038$). The results display a

clear contrast between the core and the peripheral verb types, which supports our prediction of the Split Intransitivity Hierarchy.

The ANOVA for Group 2 produces a main effect of verb type ($F(4,19)=3.327$, $p<.014$). The results also show that Group 2 differentiates across the verb types as well. Pairwise comparison tests across the verb type yield a significant difference between change of location verbs & appearance verbs ($p<.002$), change of location verbs & pre-existing condition ($p<.031$), directed motion verbs & appearance verbs ($p<.047$), and change of state verbs & appearance verbs ($p<.030$). Group 2 also exhibits a contrast in their responses between the core and the peripheral verb types, which justify our prediction of the Split Intransitivity Hierarchy again.

6.6.8.2.2 Summary of findings for *kake* construction in Experiment III

The results obtained for *kake* turned out to be hard to interpret. With respect to unergatives, there is no significant difference produced by the ANOVA metric, neither for Group 1 nor for Group 2. This reveals that their judgments exhibit a totally uneven pattern, which is not interpretable.

In contrast, with unaccusative verbs, ANOVA yields a significant difference with verb types in the judgments by both groups. This confirms that they differentiate among verb types with the *kake* construction, and also shows that they exhibit a preference for the "halfway" reading over the "inception" reading with unaccusative verbs.

What is intriguing is that the learners more significantly differentiate among verb types than the native controls, which is shown by the value of ANOVA with a main effect of verb type ($p<.002$ for Group 1 / $p<.014$ for Group 2). This deserves further consideration.

CHAPTER 7

CONCLUSIONS

7.0 Introduction

In this chapter, the overall findings of the three main studies are summarized and the main issues underlying this study are discussed. Two main verb types were tested in this study: monadic verbs and dyadic verbs. The former are subclassified into unergative and unaccusative verbs. The latter includes Japanese native verbs, Sino-Japanese verbs, and psych verbs. The results are described separately for monadic and dyadic verbs. In order to properly evaluate the outcomes, I will refer back to the experimental questions and the hypotheses, along with the results.

I then move on to the discussion of issues which deserve further research, in section 7.2. This chapter concludes by making some suggestions for potential areas of future research.

7.1 Summary and discussions of results

7.1.1 Monadic verbs

Monadic verbs were investigated in Experiment I, Experiment II and Experiment III with three different constructions: Quantifier Float (QF), the *takusan* construction, and the *kake* construction. The research questions for monadic verbs are:

1. Will L2 learners of Japanese display a different sensitivity to the unaccusative-unergative distinction depending on the position of monadic verbs along the Split Intransitivity hierarchy?
2. Will L2 learners of Japanese exhibit more determinate intuitions on unergative syntactic behaviour with verbs denoting non-motional process and less determinate intuitions with verbs denoting involuntary processes? Will they display more determinate intuitions on unaccusative syntactic behaviour with verbs denoting change of location and less determinate intuitions with stative verbs?

The hypothesis was that learners would show a stronger preference for grammatical sentences over ungrammatical sentences with core unergative verbs, and a weaker

preference with peripheral unergative verbs. To take Quantifier Float (QF) as an example, unergative verbs do not allow the [+QF] construction, but do allow the [-QF] construction. Our prediction is that learners would reject the [+QF] construction with core unergative verbs more decisively than with peripheral unergative verbs. In contrast, unaccusative verbs allow both [+QF] and [-QF] constructions, which is characterised as "optionality". Our hypothesis for unaccusative verbs is: learners would be better able to recognise the grammaticality of optional constructions with core unaccusative verbs than peripheral unaccusative verbs. The discussion about unergatives and unaccusatives follows:

a. Unergative verbs

Overall the results of the QF test for unergative verbs strongly exhibit the trend which is predicted by the Split Intransitivity Hierarchy. As presupposed in our hypothesis, the participants produced more determinate judgments with core unergative verbs, while they had less determinate judgments with peripheral unergative verbs. This trend is observed more clearly in the responses of the native control group than in the learner groups. The native speakers made finer distinctions among verb types within the class of unergative verbs, exhibiting even some gradient effects along the Split Intransitive Hierarchy. The learner groups also show a slight preference for the [-QF] construction over the [+QF] construction with core unergative verbs, though it is not as clear as that of native speakers. Comparing the two learner groups, post-beginner and intermediate, the preference exhibited by the intermediates is closer to that of the native controls, consistent with our prediction. It could be assumed that longer exposure to Japanese may have brought about this difference.

The results of the *takusan* test confirm the findings obtained for the QF construction. The intermediates and the native controls show a very similar pattern in their responses regarding unergatives, which is also consistent with the prediction of the Split Intransitivity Hierarchy. The *takusan* construction was tested with two different instruments: a picture-cued task and a preference task, but the employment of different instruments makes little difference to the results.

Among the three properties employed in the studies, the QF and *takusan* constructions share this similar pattern in the results with unergatives. However, the results of the *kake* construction were quite different from the other two properties, and not so easy to interpret. Given that the hypothesis of Tsujimura and Ida (1999) is plausible (see the

details for section 3.1.6), it can be assumed that the results would be partly due to the two different readings which the *kake* construction denotes: the *halfway* reading, and the *inception* reading, where the *inception* reading is possible regardless of the verb type. Thus, according to the account by Tsujimura and Ida (1999), the *kake* construction cannot be an appropriate diagnostic test to distinguish between unergatives and unaccusatives, because there always remains the possibility of the *inception* reading no matter whether the verb is unergative or unaccusative. The *kake* construction was initially introduced by Kishimoto (1996) as a diagnostic test for Split Intransitivity. Later, however, replying to the criticisms by Tsujimura and Ida (1999), Kishimoto (2000) changed his view and allowed the distinction between two readings of the *kake* construction, though he claims that the *inception* reading is not the main focus of his study. Since this point still seems to need further research, it remains open.

b. Unaccusative verbs

The results for unaccusative verbs exhibit some variation among three different properties: the QF, *takusan*, and *kake* constructions. With respect to *takusan*, an even pattern of responses is displayed within and across the two groups (intermediate and controls)—both groups show a clear preference for the subject reading over the *a lot* reading, which agrees with our prediction. In contrast, the QF and *kake* construction tests exhibit an uneven pattern, and this is hard to generalise, even though both of the constructions produce significant differences across verb types. It can be explained that these results partly stem from the different nature of the *takusan* construction from the other two constructions: QF and *kake*. That is, the QF construction with unaccusative verbs is optional, and the *kake* construction is ambiguous between the two readings with unaccusative verbs, while the *takusan* construction is neither optional nor ambiguous. This seems to relate to some previous research results - learners are likely to be confused by optionality in the input. That is, the speed and efficiency of acquisition are affected by the robustness and regularity in input. It appears that the optionality and ambiguity in QF and the *kake* construction delays their acquisition compared to the *takusan* construction. Further research is necessary to see whether more exposure will make a difference in the results, and whether learners also start differentiating between [+QF] and [-QF] in spite of the fact that both are optional and correct.

c. Summary

The implications of these results can be summarised in the following three points.

First, the results confirm that the learners of Japanese at low level and intermediate level are clearly aware of the distinction between unergatives and unaccusatives. Second, the judgments on unergatives by the learners and the native speakers are conditioned by the Split Intransitivity Hierarchy, while their judgments on unaccusatives do not exhibit the pattern which is predicted by the Split Intransitivity Hierarchy. Third, this study suggestively identifies an order of acquisition in the developmental path—learners may acquire knowledge of unergatives which do not exhibit optionality, earlier than knowledge of unaccusativity, which does exhibit optionality.

7.1.2 Dyadic verbs

Dyadic verbs were explored in Experiment I and Experiment II, including Japanese native verbs, Sino-Japanese verbs, and psych verbs. Japanese native verbs were investigated only in Experiment I, but apart from that Experiment I and Experiment II employed almost the same test items in slightly different contexts and constructions. The research questions for dyadic verbs are as follows:

1. Will L2 learners of Japanese experience more difficulty in making a distinction between alternating and non-alternating verbs when they lack an overt morphological feature like in English?
2. Will L2 learners of Japanese transfer their L1 knowledge of the intransitive/transitive alternation to Japanese when they cannot get any information about the verb's properties from overt morphological forms?
3. Will L2 learners of Japanese show a preference for the passive construction over the inchoative construction with alternating verbs?
4. Will learners of Japanese experience any difficulty in judgments for Subject-Experiencer (SE) verbs? Also, will they be aware of the overt causative morphology in Japanese psychological verbs?
5. Will English speaking learners accept Object-Experiencer (OE) verbs more readily than the native control group does as suggested in White (1998,1999)?

Among the three kinds of verbs tested in the studies, Japanese native verbs and Sino-Japanese verbs were included with the aim of exploring how alternating and non-alternating verbs are represented given the interplay of covert/overt morphology in

L2 grammar. Psych verbs were tested to see whether L2 learners are aware of a difference in correspondence of OE and SE verbs between Japanese and English as embodied by the research questions 4 and 5. Our hypotheses in respect of these research questions are presented as follows:

1. Even if the learners' L1 does not have overt morphology which distinguishes between intransitive and transitive verbs, the overt morphology would be of some help in learning the difference between them. Thus the subset of verbs in Japanese which are morphologically identical in their inchoative and causative forms may also be of difficulty for English speaking learners of Japanese.
2. If Montrul's view of transfer is plausible, L1 is not supposed to have a role at the argument structure level. Thus, English-speaking learners of Japanese would not transfer their L1 knowledge of the causative/inchoative alternation to Japanese.
3. Learners would find Subject-Experiencer (SE) verbs in Japanese difficult, because there is a difference in correspondence of Object-Experiencer (OE) and SE verbs between Japanese and English – several SE verbs in Japanese correspond to OE verbs in English.

Overall, the results with all types of verbs were consistent with our main prediction. Let us first examine the results for each verb type.

a. Japanese native verbs

Starting with Japanese native verbs, all the groups (post-beginner, intermediate, and native speakers) correctly differentiated between alternating and non-alternating verbs, regardless of difference in degree of determinacy each group showed. The test items included some nonce Japanese verbs, which do not exist but were made up as an inchoative pair of transitive verbs as shown in (291a); it turns out that L2 learners of Japanese did not accept the pseudo inchoative constructions, but successfully rejected them as did the native speakers.

- (291) a. * Seiseki-ga kurabat-ta
 grade-NOM compare-PAST
 "* The grade compared"

- b. Seiseki-ga kurabe - rare - ta
grade-NOM compare(int)-PASS-PAST
"The grade was compared"

What is to be noted here is that learners were not supposed to have been previously exposed to a fake verb such as "*kurabaru* (compare;int)" which was made up as an inchoative counterpart for the transitive verb, "*kuraberu* (compare)". However they did not have any problem rejecting the fake verb.

There are two possible explanations here. One of them assumes that they reject it because the equivalent verb in their L1 (English), *compare*, never allows the inchoative form such as **The grade compared*. Another account presumes that indirect positive evidence explains their success in rejecting the fake inchoative construction of Japanese transitive verbs. That is, they just did not accept it because they never encountered such a verb in the input.

Before reaching a decision about which might be the more plausible account, we need to examine the results of Sino-Japanese transitive verbs as well. Since the native Japanese verbs semantically equivalent to Sino-Japanese transitive verbs were employed in Study I, there should be no problem arising from comparing the results between them. If L1 transfer involves the results of Japanese native transitive verbs, learners are

supposed to treat the equivalent Sino-Japanese transitive verbs in the same way - they would correctly reject the inchoative construction of Sino-Japanese transitive verbs. So we shall return to this point after examining the results for Sino-Japanese verbs.

b. Sino-Japanese verbs

Experiment I and Experiment II yielded different results with Sino-Japanese verbs. The main concern with these verbs is to see whether L2 learners of Japanese correctly differentiate between alternating and non-alternating Sino-Japanese verbs, despite the fact that they do not have any overt morphological features.

The results of Experiment I show that neither of the learner groups (post-beginner and intermediate) was able to differentiate between alternating and non-alternating verbs, and both groups wrongly accepted the ungrammatical inchoative construction with

Sino-transitive verbs as in (292).

- (292) *Nimotsu-ga hoteru-ni UNSO-sita
luggage-NOM hotel-at carry(int)-did
"*Some luggage carried to the hotel"

In contrast, in Experiment II, the intermediate learner group managed to make a distinction between alternating and non-alternating Sino-Japanese verbs, though their judgments ($p < .012$) are not as accurate as those of native speakers ($p < .0001$).

The question which arises here is, what is responsible for this difference in performance by L2 learners between Experiment I and Experiment II. Considering their background data along with the results of preliminary test, the Study II learner group is placed at a slightly lower level than the intermediates of Experiment I. Thus, the results do not seem to be traced back to their proficiency level. The current study can not provide a specific reason for this result, but it is likely that some other factors such as exposure to formal instruction are involved.

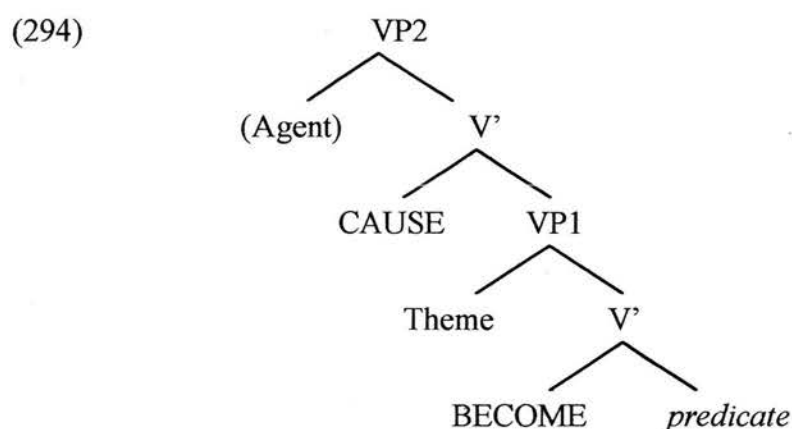
Putting aside the unexpected results from Experiment II, we shall just focus on the results of Experiment I, and now return to the question which we deferred from the previous part - why learners were able to reject the nonce Japanese native verbs, which were made up as an inchoative counterpart for certain transitive verbs. Preliminarily, I proposed two possible accounts: one involving L1 transfer, another involving indirect negative evidence. There seems to be no way to confirm the latter, while the former appears to be confirmable by comparing the results between Japanese transitives and Sino transitives. Look at the following examples of test sentences employed in Experiment I.

- (293) a. *Seiseki-ga **kurabat**-ta (fake inchoative counterpart for Japanese transitives)
grade -NOM compare(int)-PAST
"*The grade compared "
b. *Seiseki-ga **HIKAKU**-si-ta (fake inchoative counterpart for Sino-transitives)
grade -NOM compare (int)-did
"*The grade compared"

If L1 transfer influences their judgments, the learners are supposed to treat (293a) and

(293b) in the same way and reject both correctly, because the equivalent English verb to "kuraberu" and "HIKAKU-suru"; "compare", does not allow the inchoative construction, either. However, the results show that both learners' groups (post-beginners and intermediates) wrongly accepted ungrammatical inchoative forms with Sino-Japanese transitive verbs such as (291b) despite the fact that both groups correctly rejected ungrammatical inchoative forms with Japanese native transitive verbs such as (293a) without any problem. Thus, their responses could not be attributed to L1 transfer. Consequently, we are left with the account based on indirect negative evidence, but in order to confirm the validity of this account, further research is needed.

There still remains one question about the learners' judgments here - what made them wrongly accept the inchoative forms with the Sino-Japanese transitive? What did learners resort to for making the judgments? Since Sino-Japanese verbs do not encode the inchoative/causative distinction with an overt morphology (suffix), learners cannot get any clue from it, but they also did not rely on their L1, either. If they did, they would not have failed to make a correct judgement. Then what might be a plausible account here? It appears that Montrul's Default Transitive Template (see the details for 5.2.9) as in (294) might provide a good account for this situation.



(Montrul 2000:244)

Montrul (1997, 2000) explains, "...children fall back on a default transitive template when they know the broad meaning of a given verb but have not yet learned the specific contents of the template that determine which verbs are only transitive, which ones are only intransitive, and which ones alternate" (Montrul 2000, 244). This template which generates both transitive and intransitive seems to be perfectly accommodatable into

Japanese, because Japanese widely allows the inchoative/causative alternations. Thus this would not cause any problem as long as the learners map the verb onto this template. However, when it comes to the non-alternating verbs, this template is no longer applicable. If learners have not acquired the narrow meaning of the verb yet, such as whether the agent is specified or not, they simply map the verb onto this template, and wrongly hypothesise that the verb allows an inchoative pair. This is assumed to be a mechanism where inchoative errors of non-alternating verbs are made. This template account also gives a good explanation for the findings involving the third research question, namely whether there is a preference for the passive construction. The results reveal that learners accept the inchoatives as firmly as passives, and even show a slight preference for inchoatives. Based on the template account, it is assumed that learners apply the template to the verb and simply suppress CAUSE and the external argument.

Thus, it is plausible to assume learners rely on this template and hypothesise that the verb would allow an alternation between inchoatives and causatives at the developmental stage where they have not acquired the narrow meaning of a verb (such as whether the agent is specified or not). They wrongly hypothesise that Sino-Japanese non-alternating verbs would have an inchoative alternant. This account is compatible with Montrul's modular view of transfer, because templates are influenced by the knowledge of UG, and also it relates to the developmental path.

c. Psych verbs

The research question shared between Experiment I and Experiment II is whether learners are aware of the difference in distribution of OE and SE verbs between Japanese and English. That is, OE verbs in Japanese are scarce, therefore an SE verb + *(s)ase* construction plays a role to make up for the lack of OE verbs in Japanese. In contrast, English does not have many SE verbs, thus the inchoative counterparts of OE verbs can only be described as adjectives or passives (ex. *be angry*, *be surprised*)

The results from both Experiment I and Experiment II reveal a clear contrast between the learner groups and the native control group. Predictably, native speakers did not have any problem differentiating between grammatical and ungrammatical sentences, while all learner groups failed to reject ungrammatical sentences such as Subject-Experiencer construction with Causer, or pseudo OE construction without the causative morpheme *(s)ase* as shown in (295) and (296).

- (295) * Kare-wa yuuzin ni yokisenu henzi de mayot-ta
 he-TOP friend by unexpected response at puzzle-PAST
 "He was puzzled at the unexpected response by his friend"
- (296) * Kuruma-no zyuutai - ga kanozyo -o iratui-ta
 car - GEN congestion-NOM she -ACC irritate-PAST
 "The traffic congestion irritated her"

What kinds of implication might be drawn from this result? What is certain is that learners do not seem to be aware of the different nature of Japanese and English psych verbs. More concretely, as English does not have any SE verbs equivalent to Japanese SE verbs such as "*mayou*"(become puzzled), and "*iratsuku*"(become irritated), the only way to internalize these verbs in their L1 is to interpret them as passive form or adjective. I assume here that this process of internalization might be a trigger for such errors. That is, when they see in the test sentences verbs such as "*mayou*"(become puzzled) in (295), the meaning would be internalized as "become puzzled". Thus they accept the ungrammatical sentence with causer (*by*-phrase) without any hesitation.

Then, what might be the mechanism for making errors such as accepting (296)? There is another phenomenon revealed by the results - the learner groups wrongly accepted sentences such as (296) along with the grammatical OE constructions as shown in (297).

- (297) Kuruma-no zyuutai - ga kanozyo- o iratuk -ase - ta
 car - GEN congestion-NOM she - ACC irritate-CAUSE-PAST
 "The traffic congestion made her irritated"

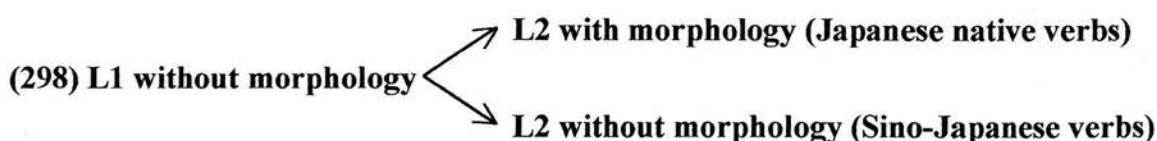
We can assume from these findings, that learners make no distinction between two types of constructions such as (296) and (297), and they just accepted both. What this result suggests is that they obviously do not have any idea that there are technically no "OE verbs" in Japanese, since these are replaced by SE verbs + (*s*)*ase* construction. Further investigation will shed more light on these phenomena.

7.2 Suggestions for further research

Since the importance of the lexicon in L2 acquisition has been recognised in terms of semantic-syntactic correspondence, verb semantics and morphosyntax in L2 acquisition have been researched with various different grammatical phenomena such as the unaccusative/unergative distinction, the causative/inchoative alternations, and many others. Research on the L2 acquisition of the syntax-semantics interface has been carried out almost exclusively in Indo-European languages. Although recently there is more literature on the characterisation of split intransitivity in Japanese, as far as L2 acquisition is concerned, surprisingly few studies have so far been reported (Hirakawa 1999, 2000, 2001; Sorace and Shomura 2001).

In this respect, this study makes a crucial contribution to ongoing research. In particular, our study is unique in the following two points. Firstly, with respect to the Split Intransitivity Hierarchy (Sorace 2000), this is the first application of the hierarchy to non-Indo European language.

Secondly, with respect to dyadic verbs, along much the same lines as Montrul (1997, 1999) on the acquisition of the inchoative/causative alternation in three languages-English, Spanish, and Turkish, this study offers evidence on the acquisition of the inchoative/causative alternation in Japanese. What is original in the research design is that our study targets two different verb classes: one is Sino-Japanese verbs which do not mark the causative/inchoative alternation with any morphological marker; another is the synonymous Japanese native verbs which mark the alternation with a suffix. Targeting these verb classes seems to be advantageous for exploring the influence brought about by overt/covert morphology, because the synonyms share the same argument structure but differ in their morphological manifestation. This makes it possible to compare the degree of difficulty experienced by learners between overt/covert morphology. Another point to note is that English-speaking learners of Japanese were chosen as the participants, since English does not mark the causative/inchoative alternation with a morphological marker as illustrated in (298), which distinguishes our study from that of Montrul.



These are two contributions of this study, however this study is just a modest beginning. There is still much room for future investigation. Before concluding this chapter, I would like to make some suggestions for the possibilities of future studies concerning the following three issues. First of all, with respect to testing on monadic verbs in Japanese, it would be possible to reformulate the Split Intransitive Hierarchy with new classes of verbs so that it conforms to semantic and aspectual characteristics of Japanese verbs better. Recall the predictions of the Split Intransitive Hierarchy - different languages would have different cutoff points along the hierarchy, which justifies devising a new version of the Split Intransitive Hierarchy by combining classes or substituting new verb classes along the hierarchy. It would also be useful to reexamine carefully the semantic determinants of Split Intransitivity, which are relevant for Japanese, because, in Japanese, views on the semantic determinants of split intransitivity still differ among scholars, and there is no agreement on this point, which is widely accepted. Kishimoto (1996) suggests "volitionality" as a semantic parameter to determine the distinction between unergatives and the unaccusatives, while Toratani (1997), Tsujimura (1999), Tsujimura and Ida (1999) claims that "telicity" is the semantic component of split intransitivity. However, Kishimoto (2000) does not deny that "telicity" is one of the components which determine split intransitivity. This issue calls for further investigation.

Secondly, regarding dyadic verbs, it would be interesting and worthwhile to replicate Montrul's studies (1997,1999) in different languages such as Japanese so as to confirm her findings and attest her claim on transfer - "UG involves in the acquisition of argument structure, while L1 influence plays an important role at the morphological level." There seems to be room for further investigation employing the two different types of Japanese verbs which were referred to above: Japanese native verbs, which mark the transitive/intransitive distinction with a morphological manifestation; Sino-Japanese verbs, which do not have any overt morphology to encode the transitive/intransitive distinction. In this study, only a small number of verbs from each type were tested because of the limitation in the number of sentences which can be included in the test items for one session.

Finally, these are the methodological issues which are often pointed out — more participants at wider range of proficiency level, more diverse properties, and more crosslinguistic variation would be required. In fact, at the starting point of this project,

I planned to assume three different proficiency levels (post-beginners, intermediates, and near natives) along with native controls, but the idea of including a level for near native speakers was abandoned because of difficulties in finding a suitable group of such learners. As far as properties are concerned, most of the main properties which had been presented at the point of time were employed, but it is certain that other new constructions will be reported as evidence for split intransitivity. With respect to the crosslinguistic issue, our study did not carry out a bi-directional experimental study on both Japanese learners of English and English learners of Japanese. Part of the reason is that the evidence of split intransitivity is poorer in English than Japanese, and even the available evidence is still controversial (ex. *there*-inversion, resultative construction, etc.) However, it would be still be worthwhile to conduct two-way experiments between Japanese and other languages, not only English but also other non-Indo European languages such as Chinese and Korean, which would undoubtedly provide a wide range of relevant data.

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APPENDIX A: Test instructions and materials

A.1 Experiment I

Magnitude Estimation Task (instruction)

Judging Line Length

You will be presented with a series of 12 lines of varying lengths. Your task is to tell how long they seem by assigning numbers to them. You will use a reference line to assign values. Let the first line be your reference. Give it any numbers that seems appropriate to you, bearing in mind that some of the lines will be longer than the reference and some will be shorter.

Assign a number to each line so that it represents how long it is in proportion to the reference line. The longer it is compared to the reference, the larger the number you will use. So if you feel that a new line is twice as long as the first, give it a number twice the first number, if it's a third as long, provide a number a third as big as the first.

So if the reference is this line:



and you give it the number 3, and you have to judge this line:



You should probably give it 6. Then this one:



might be 1.

There is no limit to the range of numbers you may use. You may use whole numbers and fractions or decimal. If you assigned that first line the number 1, you might want to call the last one 0.15. Just try to make each number match the length of the line as you see it.

Do you have any questions?

この実験の目的は、日本語を母語とする皆さんがある日本語文に対し、その自然さの度合いをどう判断するのかを見ようとするものです。今回は心理物理学（人間の知覚、印象の研究）からの手法を取り入れ、皆さんの言葉に対する印象に関して調査するといった試みです。少し、やり方に慣れるためにも、まず本実験に入る前に簡単な練習から始めたいと思います。

まず、今から12本のそれぞれ長さの違う線が提示されます。皆さんはその長さの違いを数字を使って表現してみてください。まず、最初に目にした線を基準に数字を決め、後から示される線を判断して行って下さい。例えばもし次ぎの線が短ければ、少ない数字、もし長ければ大きい数字といった具合にです。つまり、最初の線より、次ぎの線の方が2倍は長いと思えばその数字も2倍になります。では具体例で見てみましょう。まずは次ぎの線が基本となる線です。

仮にあなたがこの線に3という数字を与えたとします。それで次ぎの線が、

ならば、おそらくあなたは6という数字を与えるでしょう。それで今度は次ぎが

ならば、1という数字が妥当だと思われます。

使用できる数字の範囲は制限されていません。分数でも小数でも必要に応じて使って構いません。例えば一番上の線に1という数字を与えたとして、3番目を0.33といった具合にです。ただし、マイナスナンバーとゼロだけは使わないで下さい。それではここで少しだけ練習してみましょう。

Numerical Magnitude Estimation of Line Length

Name: _____ Date: _____

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

8. _____

9. _____

10. _____

11. _____

12. _____

Instruction

You will see a series of sentences on the screen. These sentences are all different. Some will seem perfectly OK to you, but others will not. Your task is to judge how good or bad each sentence is, and to assign a number to each sentence to show your judgement.

For the first sentence, you can give it **any** number except for the number zero or any minus numbers. Let the first sentence be your **reference**. For each sentence after the first, assign a number in proportion to the reference sentence.

For example, if the first sentence was:

(1) cat the mat on sat the.

and you gave it a miserable 1, and if the next example:

(2) the dog the bone ate.

seemed 20 times better, you'd have to give it 20. If it seems half as good as the reference sentence, give it the number 0.5. You can use any range of positive numbers including fractions or decimals.

Please don't worry if you forgot the reference sentence. If each of your judgements is in proportion to the first, you can judge the new sentence relative to any of them that you do remember. For example, you can assign a number to the sentence by comparison to the one presented just before.

You will also listen to each sentence read aloud along with seeing it on the screen. The interval between the sentences is only seven seconds, so don't spend too long in thinking about your judgement.

Remember:

- *Use any positive numbers you like.**
- *Judge each sentence in proportion to the reference sentence.**
- *Keep up with the cassette tape without having a blank.**

やり方の説明

これから OHP のスクリーン上に 138 の日本語の文章が映され、同時に同じ文章が読み上げられます。これらの文章で同じものは一つもなく、すべてが異なるものです。皆さんはそれを見て、日本語の文章としてどの程度自然かどうかを判断して下さい。

やり方は、まず一番最初に示された文章に、ゼロと負の数（マイナスナンバー）以外の好きな正の数字（プラスナンバー）を与えます。この最初の文がこれから出てくる文章を判断する時の基準となります。次の文章が提示されたら、それが最初の文と比較してどのくらい自然かを判断し、適当な数字を与えて下さい。例えば、

- (1) 座っている、ブランコに、男の子、帽子かぶった。

この文にもしあなたが 1 という数字を与えたとして、

- (2) 男の子、帽子かぶった、ブランコに、座っている。

この文は上に比べて 20 倍程度はましだと思えば、20 という数字を与えて下さい。もしこれが、(1) よりも自然さにおいて半減すると思えば、0.5 か $1/2$ といった数字があてはまるでしょう。与える数字に制限はありません。かなり大きい数字になっても構いませんし、必要だと思えば、小数でも分数でも使って結構です。ただしゼロと負の数だけは与えないで下さい。

判断していく上で、一番 最初の文章が基準となりますが、もしそれを忘れても構いません。常に一つ前の文章と比べて数字を与えていって下さい。文章は一度しか読み上げられませんし、間の時間も 7 秒と短いので、考え込まずあくまで直感でリズムカルに進めていっていただければ結構です。

重要！

- * 正の数（プラス）であれば何でも好きな数字を使って結構です。
- * それぞれの文を一番 最初の文章と比較して、判断していって下さい。
- * カセットテープに遅れたり、空白を作ったりしないようにリズムカルに進めて下さい。

A.1 Experiment I

Magnitude Estimation Task (Test sentences)

Monadic verbs-Quantifier floating

UNERGATIVE VERBS

<Controlled non-motional process verbs>

1. *utau* (sing)

- (a) Kodomo-ga sannin [_{VP} uta-o utat-teiru]
child -NOM 3CL song-ACC sing-be
“Three children are singing”
- (b) Kodomo-ga [_{VP} uta-o sannin utat-teiru]
child -NOM song-ACC 3CL sing-be
“Three children are singing”

2. *asobu* (play)

- (a) Kodomo-ga hutari [_{VP} kooen-de ason-da]
child-NOM 2CL park-in play-PAST
“Two children played in the park”
- (b) Kodomo-ga [_{VP} kooenn-de hutari ason-da]
child -NOM park-in 2CL play-PAST
“Two children played in the park”

3. *matsu* (wait)

- (a) Gakusei-ga sannin [_{VP} mensetu-o mat-teiru]
student-NOM 3CL interview-ACC wait-be
“Three students are waiting for the interview”
- (b) Gakusei-ga [_{VP} mensetu-o sannin mat-teiru]
student-NOM interview-ACC 3CL wait-be
“Three students are waiting for the interview”

<Controlled motional process verbs>

1. *oyogu* (swim)

- (a) Syonen-ga sannin [_{VP} umi-de oyoi-da]
boy -NOM 3CL sea-in swim-PAST
“Three boys swam in the sea”
- (b) Syonen-ga [_{VP} umi-de sannin oyoi-da]
boy -NOM sea-in 3CL swim-PAST
“Three boys swam in the sea”

2. *aruku* (walk)

- (a) Kodomo-ga hutari [_{VP} yukkuri eki-ni arui-ta]
child-NOM 2CL slowly station-to walk-PAST
“Two children walked to the station slowly”
- (b) Kodomo-ga [_{VP} yukkuri eki-ni hutari arui-ta]
child-NOM slowly station-to 2CL walk-PAST
“Two children walked to the station slowly”

3. *hashiru* (run)

- (a) Gakusei-ga sannin [VP awatete byoin-ni hashit-ta]
student-NOM 3CL in a hurry hospital-to run-PAST
“Three students ran to the hospital in a hurry”
- (b) Gakusei-ga [VP awatete byoin-ni sannin hashitta]
student-NOM in a hurry hospital-to 3CL run-PAST
“Three students ran to the hospital in a hurry”

<Uncontrolled process verbs-bodily function>

1. *haku* (vomit)

- (a) Gakusei-ga hutari [VP dooro-ni hai-ta]
student-NOM 2CL road-in vomit-PAST
“Two students vomited in the road”
- (b) Gakusei-ga [VP dooro-ni hutari hai-ta]
student-NOM road-in 2CL vomit-PAST
“Two students vomited in the road”

2. *sekikomu* (cough)

- (a) Kodomo-ga sannin [VP hokori-de sekikon-da]
child-NOM 3CL dust by cough-PAST
“Three children coughed by the dust”
- (b) Kodomo-ga [VP hokori-de sannin sekikon-da]
child-NOM dust by 3CL cough-PAST
“Three children coughed by the dust”

3. *asebamu* (sweat)

- (a) Seito-ga sannin [VP syokuinsitu - de aseban-deiru]
student-NOM 3CL teacher's room-at sweat-be
“Three students are sweating in the teacher's room”
- (b) Seito-ga [VP syokuinsitu-de sannin aseban-deiru]
student-NOM teacher's room-at 3CL sweat-be
“Three students are sweating in the teacher's room”

<Uncontrolled process verbs –involuntary reaction>

1. *furueru* (shiver)

- (a) Kodomo-ga sannin [VP obakeyasiki-de hurue-teiru]
child-NOM 3CL haunted house-at shiver-be
“Three children are shivering at the haunted house”
- (b) Kodomo-ga [VP obakeyasiki-de sannin hurue-teiru]
child-NOM haunted house-at 3CL shiver-be
“Three children are shivering at the haunted house”

2. *yureru* (tremble)

- (a) Tatemono-ga hutatu [VP zisin de yure-ta]
building-NOM 2CL earthquake by tremble-PAST
“Two buildings trembled by the earthquake”
- (b) Tatemono-ga [VP zisin de hutatu yure-ta]
building-NOM earthquake by 2CL tremble-PAST
“Two buildings trembled by the earthquake”

3. *guratsuku* (waver)

- (a) Syoojyo-ga sannin [_{VP} kori-no ue-de guratui-ta]
girl-NOM 3CL ice-GEN on waver-PAST
“Three girls wavered on the ice”
- (b) Syoojyo-ga [_{VP} koori-no ue-de sannin guratui-ta]
girl-NOM ice-GEN on 3CL waver-PAST
“Three girls wavered on the ice”

<Uncontrolled process verbs-emission>

1. *hikaru* (flash)

- (a) Heddoraito-ga hutatu [_{VP} kurayami-ni hikata-ta]
headlight -NOM 2CL darkness-in flash-PAST
“Two headlights flashed in the darkness”
- (b) Heddoraito-ga [_{VP} kurayami-ni hutatu hikatta]
headlight-NOM darkness-in 2CL flash-PAST
“Two headlights flashed in the darkness”

2. *kagayaku* (shine)

- (a) nagarebosi - ga hutatu [_{VP} sora-ni kagayaita]
shooting star-NOM 2CL sky-in shine-PAST
“Two shooting stars shone in the sky”
- (b) nagarebosi - ga [_{VP} sora-ni hutatu kagayaita]
shooting star-NOM sky-in 2CL shine-PAST
“Two shooting stars shone in the sky”

3. *niou* (smell)

- (a) Tamago-ga hutatu [_{VP} kusatte niot-teiru]
egg- NOM 2CL rotten smell-be
“Two eggs smell rotten”
- (b) Tamago-ga [_{VP} kusatte hutatu niot-teiru]
egg -NOM rotten 2CL smell-be
“Two eggs smell rotten”

UNACCUSATIVE VERBS

<Change of location>

1. *tuku* (arrive)

- (a) Kyaku- ga sannin [_{VP} ryokan-ni tui- ta]
guest -NOM 3CL inn-at arrive-PAST
“Three guests arrived at the inn”
- (b) Kyaku-ga [_{VP} ryokan-ni sannin tui-ta]
guest-NOM inn - at 3CL arrive-PAST
“Three guests arrived at the inn”

2. *kuru* (come)

- (a) Gakusei-ga hutari [_{VP} kenkyusitu-ni ki-ta]
student-NOM 2CL seminar room-to come-PAST
“Two students came to the seminar room”

- (b) Gakusei-ga [VP kenkyusitu-ni hutari ki-ta]
 student-NOM seminar room-to 2CL come-PAST
 "Two students came to the seminar room"

3. *saru* (leave)

- (a) Kyaku-ga hutari [VP kaizyo - kara sat-ta]
 guest-NOM 2CL event hall-from leave-PAST
 "Two guests left the event hall"
- (b) Kyaku-ga [VP kaizyo - kara hutari sat - ta]
 guest-NOM event hall-from 2CL leave-PAST
 "Two guests left the event hall"

<Change of condition-directed motion>

1. *noboru* (ascend)

- (a) Gakusei-ga hutari [VP yama - ni nobot- ta]
 student-ACC 2CL mountain-to climb-PAST
 "Two students climbed the mountain"
- (b) Gakusei-ga [VP yama - ni hutari nobot-ta]
 student-ACC mountain-to 2CL climb-PAST
 "Two students climbed the mountain"

2. *susumu* (advance)

- (a) Heitai- ga sannin [VP mae- ni susun- da]
 soldier-NOM 3CL forward-to advance-PAST
 "Three soldiers advanced forward"
- (b) Heitai- ga [VP mae-ni sannin susun - da]
 soldier-NOM forward-to 3CL advance-PAST
 "Three soldiers advanced forward"

3. *agaru* (rise)

- (a) Tako-ga hutatu [VP sora-ni agat-teiru]
 kite -NOM 2CL sky-to rise-be
 "Two kites are rising to the sky"
- (b) Tako-ga [VP sora-ni hutatu agat-teiru]
 kite-NOM sky-to 2CL rise-be
 "Two kites are rising to the sky"

<Change of condition- change of state>

1. *kusaru* (rot)

- (a) Tamago-ga hutatu [VP reizooko-de kusatta]
 egg - NOM 2CL fridge -in rot-PAST
 "Two eggs have rotten in the fridge"
- (b) Tamago-ga [VP reizookonai-de hutatu kusat-ta]
 egg-NOM fridge - in 2CL rot-PAST
 "Two eggs have rotten in the fridge"

2. *kuchiru* (decay)

- (a) Hasi - ga hutatu [VP huusetu-de kutii-teiru]
 bridge-NOM 2CL weather-by decay-be
 "Two bridges have been decayed by weathering"

- (b) Hashi-ga [VP huusetu-de hutatu kuti-teiru]
 bridge-NOM weather-by 2CL decay-be
 “Two bridges have been decayed by weathering”

3. *shioreru* (wilt)

- (a) Bara-ga mittu [VP atusa-de siore-ta]
 rose-NOM 3CL heat-by wilt-PAST
 “Three roses wilted by heat”
- (b) Bara-ga [VP atusa-de mittu siore-ta]
 rose-NOM heat-by 3CL wilt-PAST
 “Three roses wilted by heat”

<Change of condition-appearance>

1. *arawareru* (appear)

- (a) Usagi-ga nihiki [VP yabu-kara arawareta]
 rabbit-NOM 2CL bush-from appear-PAST
 “Two rabbits appeared from the bush”
- (b) Usagi-ga [VP yabu-kara nihiki arawareta]
 rabbit-NOM bush-from 2CL appear-PAST
 “Two rabbits appeared from the bush”

2. *okoru* (happen)

- (a) Satuzinziken-ga niken [VP konsyu okot-ta]
 murder – NOM 2CL this week happen-PAST
 “Two cases of murder happened this week”
- (b) Satuzinziken-ga [VP konsyu niken okot-ta]
 murder-NOM this week 2CL happen-PAST
 “Two cases of murder happened this week”

3. *shojiru* (arize)

- (a) Mondai-ga niken [VP tudukete syozita]
 problem-NOM 2CL in succession arize-PAST
 “Two problems arized in succession”
- (b) Mondai-ga [VP tudukete niken syozita]
 problem-NOM in succession 2CL arize-PAST
 “Two problems arized in succession”

<Continuation of a pre-existing condition>

1. *todomaru* (stay)

- (a) Kyaku-ga hutari [VP ryokan-ni todomat-ta]
 guests-NOM 2CL inn-in stay-PAST
 “Two guests stayed in the inn”
- (b) Kyaku-ga [VP ryokan-ni hutari todomat-ta]
 guests-NOM inn-in 2CL stay-PAST
 “Two guests stayed in the inn”

2. *tuduku* (continue)

- (a) Koogi-ga hutatsu [VP onazi kyoositu-de tudui-ta]
 lecture-NOM 2CL same room – in continue-PAST
 “Two lectures continued in the same room”

- (b) Koogi-ga [VP onazi kyoositu-de hutatu tudui-ta]
 lecture-NOM same room- in 2CL continue-PAST
 “Two lectures continued in the same room”

3. *nokoru* (remain)

- (a) Kasa - ga nihon [VP genkan-ni nokot-teiru]
 umbrella-NOM 2CL entrance-at remain-be
 “Two umbrellas remain at the entrance”
 (b) Kasa - ga [VP genkan - ni nihon nokot-teiru]
 umbrella-NOM entrance-at 2CL remain-be
 “Two umbrellas remain at the entrance”

<Existence of a condition-concrete states>

1. *aru* (be)

- (a) Keeki-ga hutatsu [VP teeburu-ni aru]
 cake-NOM 2CL table-on be
 “Two cakes are on the table”
 (b) Keeki-ga [VP teeburu-ni hutatsu aru]
 cake-NOM table-on 2CL be
 “Two cakes are on the table”

2. *iru* (need)

- (a) Tamago-ga hutatsu [VP tyoori-ni iru]
 eggs-NOM 2CL cooking-for need
 “Two eggs are needed for cooking.”
 (b) Tamago-ga [VP tyoori - ni hutatsu iru]
 eggs-NOM cooking-for 2CL need
 “Two eggs are needed for cooking”

3. *sonzai-suru* (exist)

- (a) Toki-ga niwa [VP yamaoku-ni sonzai-suru]
 ibis-NOM 2CL the heart of the mountain exist
 “Two ibises exist in the heart of the mountain”
 (b) Toki-ga [VP yamaoku-ni niwa sonzai-suru]
 ibis-NOM the heart of the mountain 2CL exist
 “Two ibises exist in the heart of the mountain”

<Existence of condition- simple position>

1. *yokotawaru* (lie)

- (a) Roozin - ga sannin [VP bed-ni yokotawat-teiru]
 old man-NOM 3CL bed-on lie-be
 “Three old men are lying on the bed”
 (b) Roozin-ga [VP bed-ni sannin yokotawat-teiru]
 old man-NOM bed-on 3CL lie-be
 “Three old men are lying on the bed”

2. *motaretu* (lean)

- (a) Gakusei-ga hutari [VP kabe-ni motare-teiru]
 students-NOM 2CL wall-on lean-be
 “Three students are leaning on the wall”

- (b) Gakusei-ga [VP kabe-ni hutari motare-teiru]
 students-NOM wall-on 2CL lean-be
 “Three students are leaning on the wall”

3. *shagamu* (crouch)

- (a) Kodomo-ga sannin [VP zimen-ni shagand-eiru]
 child -NOM 3CL ground-on crouch-be
 “Three children are crouching on the ground”
 (b) Kodomo-ga [VP zimen-ni sannin shagand-eiru]
 child-NOM ground-on 3CL crouch-be
 “Three children are crouching on the ground”

<Existence of condition-abstract/mental state>

1. *yorokobu* (please)

- (a) Gakusei-ga hutari [VP gookaku - o yorokon-da]
 student-NOM 2CL passing the exam-ACC please-PAST
 “Two students pleased at passing the exam”
 (b) Gakusei - ga [VP gookaku-o hutari yorokon-da]
 student-NOM passing the exam-ACC 2CL please-PAST
 “Two students pleased at passing the exam”

2. *maniau* (suffice)

- (a) Tamago-wa mittu [VP tyoori-ni maniatte-iru]
 egg -TOP 3CL cooking-for suffice-be
 “Three eggs suffice for cooking”
 (b) Tamago-wa [VP tyoori-ni mittu maiatte-iru]
 egg- TOP cooking-for 3CL suffice-be
 “Three eggs suffice for cooking”

A. 1 Experiment I

Magnitude Estimation Task (test sentences)

Dyadic verbs

I. Unspecified agent (English and Japanese allow the incho/trans alternation)

I-1. Morphologically different between inchoative and causative verbs

1. a. Daigaku ga betu no mati ni utut-ta (**inchoative**)
university NOM another of town to move-PAST
“The university has moved to a different city”
b. Daigaku ga betu no mati ni utu- sare - ta (**passive**)
university NOM another of town of move-PASS-PAST
“The university was moved to a different city”
2. a. Gakkou no kisoku ga kawat-ta
school of regulations NOM change-PAST
“The school regulations has changed”
b. Gakkou no kisoku ga kae-rare-ta
school of regulations NOM change-PAST
“The school regulations were changed”
3. a. Denki no kouzi ga hazimat-ta
electricity of construction work NOM start-PAST
“The construction work for the electricity has started”
b. Denki no kouzi ga hazime-rare-ta
electricity of construction work NOM start-PASS-PAST
“The construction work for the electricity was started”
4. a. Kuruma-ga humikiri mae de tomat-ta
car NOM railroad crossing short of at stop-PAST
“The car stopped short of the railroad crossing”
b. Kuruma-ga humikiri mae de tome-rare-ta
car NOM railroad crossing short of at stop-PASS-PAST
“The car was stopped short of the railroad crossing”
5. a. Kaigi - ga nagai aida tudui-ta
meeting NOM for along time continue
“The meeting continued for a long time”
b. Kaigi - ga nagai aida tuduke- rare - ta
meeting-NOM for a long time continue-PASS-PAST
“The meeting was continued for a long time”

I-2. Morphologically identical between inchoative and causative verbs

6. a. Daigaku ga betu no mati ni idou-si-ta (**inchoative**)
university NOM another of town to move-do-PAST
“The university has moved to a different city”
b. Daigaku ga betu no mati ni idou-sare-ta (**passive**)
university NOM another of town to move-do-PAST
“The university was moved to a different city”
7. a. Gakkou no kisoku ga henkou-si-ta
school of regulation NOM change-do-PAST
“The school regulations has henkou-shi-ta”

- b. Gakkou no kisoku ga henkou-sare-ta
 school of regulation NOM change-PASS-PAST
 "The school regulations were changed"
8. a. Denki no kouzi ga kaisi-si-ta
 electricity of construction work NOM start-do-PAST
 "The construction work for the electricity has started"
 b. Denki no kouzi ga kaisi-sare-ta
 electricity of construction work NOM start-PASS-PAST
 "The construction work for the electricity was started"
9. a. Kuruma-ga humikiri mae de teisi-si-ta
 car -NOM railroad crossing at stop-do-PAST
 "The car stopped short of the railroad crossing"
 b. Kuruma-ga humikiri mae de teisi-sare-ta
 car- NOM railroad crossing at stop-PASS-PAST
 "The car was stopped short of the railroad crossing"
10. a. Kaigi - ga nagai aida keizoku-shi-ta
 meeting-NOM for a long time continue-do-PAST
 "The meeting continued for a long time"
 b. Kaigi - ga nagai aida keizoku-sare-ta
 meeting-NOM for a long time continue-PASS-PAST
 "The meeting was continued for a long time"

II. Specified animate agent (Only Japanese allows incho/trans alternation)

11. a. Kekkonsiki no hidori ga kimat-ta (inchoative)
 wedding ceremony of date NOM decide-PAST
 "The date of the wedding ceremony decided"
 b. Kekkonsiki no hidori ga kime-rare-ta (passive)
 wedding ceremony of date NOM decide-PASS-PAST
 "The date of the wedding ceremony was decided"
12. a. Nakusita saifu-ga mitukat-ta
 lost wallet NOM find-PAST
 "The lost wallet found"
 b. Nakusita saifu - ga mitukat-ta
 lost wallet NOM find-PAST
 "The lost wallet was found"
13. a. Mura-ga tanizoko ni umat-ta
 village NOM bottom of a gorge bury-PAST
 "The village buried in the bottom of a gorge"
 b. Mura - ga tanizoko ni ume-rare-ta
 village NOM bottom of a gorge bury-PASS-PAST
 "The village was buried in the bottom of a gorge"
14. a. Sakura-no-ki - ga kouen ni uwat-ta
 cherry of tree NOM park at plant-PAST
 "The cherry tree planted in the park"
 b. Sakura-no-ki -ga kouen ni ue - rare - ta
 cherry of tree NOM park at plant-PASS-PAST
 "The cherry tree was planted in the park"

15. a. Dorobo -ga miti de tukamat-ta
thief NOM road at catch-PAST
“The thief caught in the road”
b. Dorobo- ga michi de tukamae-rare-ta
thief NOM road at catch-PASS-PAST
“The thief was caught in the town”

III. Transitive verb without intransitive counterpart

III-1. Morphologically different between pseudo-inchoative and causative verbs

- 16 a. *Seiseki-ga kurasu-goto ni kurabat-ta (pseudo-inchoative)
results NOM class each by compare-PAST
“The results compared among classes”
b. Seiseki-ga kurasu-goto ni kurabe-rare-ta (passive)
results NOM class each for compare-PASS-PAST
“The results were compared among classes”
17 a. *Nimotu-ga hotel ni hakobat-ta
luggage-NOM hotel to carry-PAST
“The luggage carried to the hotel”
b. Nimotu-ga hotel ni hakob-are-ta
luggage-NOM hotel to carry-PASS-PAST
“The luggage was carried to the hotel”
18 a. *Senkyo de sityou - ga erabat-ta
vote by Mayer NOM elect-PAST
“The mayer elected by vote”
b. Senkyo de sityou-ga erab- are - ta
vote by Mayer NOM elect-PASS-PAST
“The mayer was elected by vote”
19 a. *Kaisya no okane ga tsukawat-ta
company of money NOM use - PAST
“The money of the company used”
b. Kaisya no okane ga tsukaw-are-ta
company of money NOM use-PASS-PAST
“The money of the company was used”
20 a. *Tango no imi ga sirabat-ta
word of meaning NOM look up-PAST
“The meaning of the word looked up”
b. Tango no imi ga sirabe-rare-ta
word of meaning NOM look up-PASS-PAST
“The meaning of the word was looked up”

III-2. Morphologically identical between pseudo-inchoative and causative verbs

- 21 a. *Seiseki-ga kurasu-goto ni hikaku-si-ta (pseudo-inchoative)
results NOM class each by compare-do-PAST
“The results compared among classes”
b. Seiseki-ga kurasu-goto ni hikaku -sare - ta (passive)
results NOM class each by compare-PASS-PAST
“The results were compared among classes”

- 22 a. *Nimotu- ga hotel ni unsou-si-ta
luggage NOM hotel to carry-do-PAST
"The luggage carried to the hotel"
b. Nimotu-ga hotel ni unsou-sare - ta
luggage NOM hotel to carry-PASS-PAST
"The luggage was carried to the hotel"
- 23 a. * Senkyo de sityou-ga sensyutu-si-ta
vote by Mayer NOM elect -do-PAST
"The mayer elected by vote"
b. Senkyo de sityou-ga sensyutu-sare-ta
vote by Mayer NOM elect-PASS-PAST
"The mayer was elected by vote"
- 24 a. *Kaisya no okane ga siyou-si-ta
company of money NOM use-do-PAST
"The money of the company used"
b. Kaisya no okane ga siyou-sare-ta
company of money NOM use-PASS-PAST
"The money of the company was used"
- 25 a. *Tango no imi ga tyousa-si-ta
word of meaning NOM look up-do-PAST
"The meaning of the word looked up"
b. Tango no imi ga tyousa-sare-ta
word of meaning NOM look up-PASS- PAST
"The meaning of the word was looked up"

III. Psych verbs

26. a. *Watasi-wa sensei-ni seiseki no koto de nayan-da (**SE-inchoative**)
I -TOP teacher-by results of matter by annoy-PAST
"I (got) annoyed at the results by the teacher"
b. Watasi-wa sensei-ni seiseki no koto de nayam-as-are-ta (**Causative passive**)
I - TOP teacher-by results of matter by annoy-CAUS-PASS-PAST
"I was annoyed at the results by the teacher"
27. a. *Kare-wa bosu ni sigoto no ken de otiikon-da
he -TOP boss-by work of matter by disappoint-PAST
"He (got) disappointed at the achievements by the boss"
b. Kare-wa bosu ni sigoto no ken de otikom -as-are-ta
he -TOP boss by work of matter by disappoint-CAUS-PASS-PAST
"He was disappointed at the achievements by the boss"
28. a. *Syounen-wa otoko ni donarigoe de obie-ta
boy - TOP man by yell by frighten-PAST
"The boy (got) frightened at the yell by the man "
b. Syounenn-wa otoko ni donarigoe de obie-sase-rare-ta
boy -TOP man by yell by frighten-CAUS-PASS-PAST
"The boy was frightened at the yell by the man"
29. a. *Kanozyo-wa Tom ni kyuuna tenkinn no hanasi de odoroi - ta
she- TOP Tom-by sudden transfer of story by surprise-PAST
"She (got) surprised at the news about his sudden transfer by Tom"

- b. Kanozyo-wa Tom ni kyuuna tenkinn no hanasi de odorok-as-are-ta
 she- TOP Tom-by sudden transfer of story by surprise-CAUS-PASS-PAST
 "She was surprised at the news about his sudden transfer by Tom"
30. a. *Kare-wa yuuzin ni mattaku yokisenu henzi de mayot-ta
 he-TOP friend by completely unexpected response by puzzle-PAST
 "He got puzzled at the unexpected response by his friend"
- b. Kare-wa yuuzinn ni mattaku yokisenu henzi de mayow-as-are-ta
 he-TOP friend by completely unexpected response by puzzle-CAUS-PASS-PAST
 "He was puzzled at the unexpected response by his friend"

Experiment I: Magnitude Estimation Task (original for OHP sheets)

トキが2羽、山奥に存在する。
講義が同じ教室で2つ続いた。
傘が玄関に、2本残っている。
うさぎがやぶから、2羽現われた。
殺人事件が今週、2件起こった。
少年が海で、3人泳いだ。
私はケンに昔の話で傷つけられた
子供が3人、ほこりで咳き込んだ
成績がクラスごとに比較した
子供がゆっくり駅に、2人歩いた。
単語の意味が調べた
結婚式の日取が決められた
桜の木が公園に植わった
無くした財布がつけられた
子供が3人、地面にしゃがんでいる。
会議が長い間、継続された
車が踏み切り前で停止された
講義が2つ、同じ教室で続いた。
私は太郎に成績の事で悩まされた
ヘッドライトが2つ、暗闇に光った。
客が会場から、2人去った。
選挙で市長が選出された
少女が3人、氷の上でぐらついた。
会社のお金を使用した
学生が2人、合格を喜んでいる。
選挙で市長が選んだ
単語の意味が調べられた
成績がクラスごとに比べられた
少年が3人、海で泳いだ。
泥棒が道で捕まえられた
子供が2人、ゆっくり駅に歩いた。
学生が壁に、2人もたれている。
大学が別の町に移った
生徒が職員室で、3人汗ばんでいる。
客が2人、会場から去った。
客が3人、旅館に着いた。
卵が2つ、腐って臭っている。
荷物がホテルに運送した
単語の意味が調査した
選挙で市長が選出した
子供が3人、お化け屋敷で震えている。
荷物がホテルに運ばれた
大学が別の町に移動された
大学が別の町に移動した
学生が3人、面接を待っている。
卵が調理に、3つ間に合っている。
ヘッドライトが暗闇に、2つ光った。

大学が別の町に移された
卵が調理に、2つ要る。
子供が地面に、3人しゃがんでいる。
トキが山奥に、2羽存在する。
兵隊が3人、前に進んだ。
彼は友人に全く別の意見で迷わされた
私は太郎に成績の事で悩んだ
学生が研究室に、2人来た。
荷物がホテルに運送された
会社のお金が使われた
村が川底に埋められた。
桜の木が公園に植えられた。
子供が3人、歌を歌っている。
卵が腐って、2つ臭っている。
会議が長い間、続けられた
子供がお化け屋敷で、3人震えている。
ケーキがテーブルに、2つある。
客が旅館に、2人留まった。
建物が自地震で二つ揺れた。
卵が2つ、冷蔵庫の中で腐っている。
学生が2人研究室に来た。
少年は男に怒鳴り声でおびえさせられた
凧が空に、2つ上がっている。
成績がクラスごとに比較された
単語の意味が調査された
客が旅館に、3人着いた。
子供がほこりで3人咳き込んだ
少女が氷の上で3人ぐらついた。
学校の規則が変更した
車が踏み切り前で止められた
電気の工事が始められた
流れ星が空に、2つ輝いた。
薔薇が3つ、暑さでしおれた。
凧が2つ、空に上がっている。
卵が冷蔵庫の中で、2つ腐っている。
橋が風雪で、2つ朽ちている。
彼は友人に全く別の意見で迷った
彼はボスに仕事の件で落ち込んだ
少年は男に怒鳴り声でおびえた
彼はボスに仕事の件で落ち込まされた
無くした財布が見つかった
子供が公園で、2人遊んだ。
卵が2つ、調理に要る。
電気の工事が開始した
学生が合格を、2人喜んでいる。
電気の工事が開始された
客が2人、旅館に留まった。
傘が2本、玄関に残っている。
うさぎが2羽、やぶから現われた。

問題が2件、続けて生じた。
老人がベッドに、3人横たわっている。
問題が続けて、2件生じた。
私はケンに昔の話で傷ついた
学生が山に、2人登った。
会社のお金が使用された
学生が面接を、3人待っている。
選挙で市長が選ばれた
学生が2人、壁にもたれている。
村が川底に埋まった
老人が3人、ベッドに横たわっている。
会議が長い間、継続した
ケーキが2つ、テーブルにある。
殺人事件が2件、今週起こった。
薔薇が暑さで、3本しおれた。
建物が地震で2つ揺れた。
子供が歌を、3人歌っている。
学生が2人、道路に吐いた。
成績がクラスごとに比ばった
生徒が3人、職員室で汗ばんでいる。
卵が3つ、調理に間に合っている。
泥棒が道で捕まった
学生が3人、慌てて病院に走った。
子供が2人、公園で遊んだ。
電気の工事が始まった
学校の規則が変えられた
橋が2つ、風雪で朽ちている。
学生が2人、山に登った。
学生が道路に、2人吐いた。
学生が慌てて病院に、3人走った。
流れ星が2つ、空に輝いた。
兵隊が前に、3人進んだ。
荷物がホテルに運ばった
会社のお金が使わった
結婚式の日取が決まった
学校の規則が変更された
車が踏み切り前で停止した
会議が長い間、続いた
学校の規則が変わった
車が踏み切り前で止まった

Name:		Native language:	
1. _____	36. _____	71. _____	106. _____
2. _____	37. _____	72. _____	107. _____
3. _____	38. _____	73. _____	108. _____
4. _____	39. _____	74. _____	109. _____
5. _____	40. _____	75. _____	110. _____
6. _____	41. _____	76. _____	111. _____
7. _____	42. _____	77. _____	112. _____
8. _____	43. _____	78. _____	113. _____
9. _____	44. _____	79. _____	114. _____
10. _____	45. _____	80. _____	115. _____
11. _____	46. _____	81. _____	116. _____
12. _____	47. _____	82. _____	117. _____
13. _____	48. _____	83. _____	118. _____
14. _____	49. _____	84. _____	119. _____
15. _____	50. _____	85. _____	120. _____
16. _____	51. _____	86. _____	121. _____
17. _____	52. _____	87. _____	122. _____
18. _____	53. _____	88. _____	123. _____
19. _____	54. _____	89. _____	124. _____
20. _____	55. _____	90. _____	125. _____
21. _____	56. _____	91. _____	126. _____
22. _____	57. _____	92. _____	127. _____
23. _____	58. _____	93. _____	128. _____
24. _____	59. _____	94. _____	129. _____
25. _____	60. _____	95. _____	130. _____
26. _____	61. _____	96. _____	131. _____
27. _____	62. _____	97. _____	132. _____
28. _____	63. _____	98. _____	133. _____
29. _____	64. _____	99. _____	134. _____
30. _____	65. _____	100. _____	135. _____
31. _____	66. _____	101. _____	136. _____
32. _____	67. _____	102. _____	
33. _____	68. _____	103. _____	
34. _____	69. _____	104. _____	
35. _____	70. _____	105. _____	

A.2 Experiment II

Picture-cued task (test sentences)

-Unergative-

Controlled non-motional process:

Takusan utatta "One person sang a lot"

"A lot of people sang"

Controlled motional process:

Takusan oyoida "One person swam a lot"

"A lot of people swam"

Uncontrolled process-bodily function:

Takusan asebanda "One person sweated a lot"

"A lot of people sweated"

Uncontrolled process-involuntary reaction:

Takusan hurueta "One person shook a lot"

"A lot of people shook"

Uncontrolled process-emission:

Takusan kagayaita "One star shone a lot"

"A lot of stars shone"

-Unaccusative-

Change of location:

Takusan tuita "A lot of letters arrived at once"

"Letters arrived on and on"

Change of condition-directed motion:

Takusan nobotta "A lot of people climbed"

"A person climbed high"

Change of condition-change of state:

Takusan sioreta "A lot of flowers wilted"

"A flower wilted badly"

Change of condition-appearance:

Takusan arawareta "A lot of monsters appeared"

"A monster appeared frequently"

Condition of pre-existing condition:

Takusan nokotta "A lot of umbrella remained"

"An umbrella has remained for long"

Existence of condition-concrete states:

Takusan ita "There are lot of people"/

"One person has been in the same place for long"

Existence of condition-simple position:

Takusan yokotawatta "A lot of people lay"

"One person has lain for long"

Existence of condition-abstract/mental state:

Takusan yorokonda "A lot of people became pleased"

"A person became pleased a lot"

A.2 Experiment II

Magnitude Estimation Task (test sentences)

a. Kake construction

<Unergative verbs>

Controlled non-motional process:

1. utau (sing) *utai-kake-no syoozyo "a girl, almost singing"
2. asobu (play) *asobi-kake-no kodomo "a child, almost playing"
3. matu (wait) *mati-kake-no kanzya "a patient, almost waiting"

Controlled motional process:

1. oyogu (swim) *oyogi-kake-no suiei-sensyu "a swimmer, almost swimming"
2. aruku (walk) *aruki-kake-no rozin "an old man, almost walking"
3. hasiru (run) *hasiri-kake-no syoonen "a boy, almost running"

Uncontrolled process-bodily function:

1. asebamu (sweat) *asebami-kake-no seito "a student, almost sweating"
2. haku (vomit) *haki-kake-no yopparai "drunkard, almost vomiting"
3. sekikomu (cough) *sekikomi-kake-no byoonin "a sick person, almost coughing"

Uncontrolled process-involuntary reaction:

1. hurueru (shiver) *hurue-kake-no shoozyo "a girl, almost shivering"
2. yureru (tremble) *yure-kake-no skeeta "a skater, almost trembling"
3. sekikomu (cough) *sekikomi-kake-no byoonin "a sick person, almost coughing"

Uncontrolled process-emission:

1. hikaru (flash) *hikari-kake-no heddoraito "a headlight, almost flashing"
2. kagayaku (shine) *kagayaki-kake-no nagarebosi "a shooting star, almost shining"
3. niou (smell) *nioi-kake-no tamago "an egg, almost smelling"

<Unaccusative verbs>

Change of location:

1. tuku (arrive) *tuki-kake-no densya "a train, almost arriving"
2. kuru (come) *ki-kake-no basu "a bus, almost coming"
3. saru (leave) *sari-kake-no kyaku "a guest, almost leaving"

Change of condition-directed motion:

1. noboru (climb) nobori-kake-no tozansya "a climber, almost climbing"
2. susumu (advance) susumi-kake-no guntai "an army, almost advancing"
3. agaru (rise) agari-kake-no tako "a kite, almost rising"

Change of condition-change of state:

1. kusaru (rot) kusari-kake-no tamago "an egg, almost rotted"
2. kutiru (decay) kuti-kake-no hasi "a bridge, almost decayed"
3. sioreru (wilt) siore-kake-no bara "a rose, almost wilted"

Change of condition-appearance:

1. **arawareru (appear)** *araware-kake-no usagi “a rabbit, almost appearing”
2. **okoru (happen)** *okori-kake-no ziken “an incident, almost occurring”
3. **syooziru (arise)** *syoozi-kake-no mondai “a problem, almost arising”

Condition of pre-existing condition:

1. **todomaru (stay)** *todomari-kake-no kyaku “a guest, almost staying”
2. **tuduku (continue)** *tuduki-kake-no kougi “a lecture, almost continued”
3. **nokoru (remain)** *nokori-kake-no kasa “an umbrella, almost remained”

Existence of condition-concrete states:

1. **aru (be)** *ari-kake-no keeki “a cake, almost being”
2. **iru (need)** *iri-kake-no tamago “an egg, almost needed”
3. **sonzai-suru (exist)** *sonzai-si-kake-no kami “a god, almost existing”

Existence of condition-simple position:

1. **yokotawaru (lie)** *yokotawari-kake-no roozin “an old man, almost lying”
2. **motareru (lean)** *motare-kake-no gakusei “a student, almost leaning”
3. **syagamu (crouch)** *syagami-kake-no kodomo “a child, almost crouching”

Existence of condition-abstract/mental state:

1. **yorokobu (please)** *yorokobi-kake-no gakusei “student, almost pleased”
2. **maniau (suffice)** *maniai-kake-no tamago “an egg, almost sufficed”

b. Sino-Japanese construction

<Both Japanese and its English equivalent allow alternation>

1. kaisi-suru (start)

- a. Denki -no kouzi - ga kaisi-si-ta
electricity-GEN construction-NOM start-do-PAST
“The construction work for the electricity started”
- b. Denki -no kouzi - o kaisi-si-ta
electricity-GEN construction-ACC start-do-PAST
“(They) started the construction work for the electricity”

2. syuuryou-suru (finish)

- a. Natsu - no koutuansen- undo-ga syuuryou-si-ta
summer-GEN traffic safety-campaign-NOM finish-do-PAST
“The traffic safety campaign in summer has finished”
- b. Natsu - no koutuansen- undo-o syuuryou-si-ta
summer-GEN traffic safety-campaign-ACC finish-do-PAST
“(They) finished the traffic safety campaign in summer”

3. idou-suru (move)

- a. Daigaku -ga betu-no mati-ni idou-si-ta
university-NOM another-GEN town-to move-do-PAST
“The university moved to a different city”
- b. Daigaku -o betu-no mati-ni idou-si-ta
university-ACC another-GEN town-to move-do-PAST
“They moved the university to a different city”

4. teisi-suru (stop)

- a. Arasi-de fune – no unkou- ga teisi-si-ta
storm-by ship-GEN service-NOM stop-do-PAST
“The ship service has stopped because of the storm.”
- b. . Arasi-de fune – no unkou- o teisi-si-ta
storm-by ship-GEN service-ACC stop-do-PAST
“They stopped the ship service because of the storm.”

5. keizoku-suru (continue)

- a. Kaigi- ga nagai aida keizoku-si-ta
meeting-NOM for a long time continue-do-PAST
“The meeting continued for a long time”
- b. . Kaigi- o nagai aida keizoku-si-ta
meeting-ACC for a long time continue-do-PAST
“They continued the meeting for a long time”

<Only Japanese allows the transitive/intransitive alternation>

1. kettei-suru (decide)

- a. Kekkonsiki – no hiniti- ga kettei-si-ta
wedding ceremony-GEN date-NOM decide-do-PAST
“The date of the wedding ceremony (was) decided”
- b. . Kekkonsiki – no hiniti- o kettei-si-ta
wedding ceremony-GEN date-ACC decide-do-PAST
“They decided the date of the wedding ceremony”

2. enki-suru (postpone)

- a. Roketto -no utiage –ga enki-si-ta
rocket –GEN launching-NOM postpone-do-PAST
“The launching of the rocket (was) postponed”
- b. a. Roketto -no utiage –o enki-si-ta
rocket –GEN launching-ACC postpone-do-PAST
“They postponed the launching of the rocket”

3. haisi-suru (abolish)

- a. Zidaiokure -no syuukan –ga haisi –si- ta
old-fashioned –GEN custom-NOM abolish-do-PAST
“The old-fashioned custom (was) abolished”
- b. Zidaiokure -no syuukan –o haisi –si- ta
old-fashioned –GEN custom-ACC abolish-do-PAST
“They abolished the old-fashioned custom”

4. bunkai-suru (decompose)

- a. hutatu –no kagakubussitu –ga bunkai –si-ta
two- GEN chemical matters-NOM decompose-do-PAST
“Two types of chemical matters (were) decomposed”
- b. . hutatu –no kagakubussitu –o bunkai –si-ta
two- GEN chemical matters-ACC decompose-do-PAST
“They decomposed two types of chemical matters”

5. kakudai-suru (enlarge)

- a. Syasin –ga ookiku kakudai-si-ta
photo-NOM big enlarge-do-PAST

“The photo (was) enlarged”

- b. Syasin -o ookiku kakudai-si-ta
photo-ACC big enlarge-do-PAST
“They enlarged the photo”

< Neither English or Japanese allows the alternation >

1. zissi-suru (enforce)

- a. * Sekai-de heiwaundo - ga zissi-si-ta
world-in peace campaign-NOM enforce-do-PAST
“The peace campaign (was) enforced all over the world”
b. Sekai-de heiwaundo - o zissi-si-ta
world-in peace campaign-ACC enforce-do-PAST
“They enforced the peace campaign all over the world”

2. bunseki-suru (analyse)

- a. * Zikken- no kekka-ga bunseki-si-ta
experiment-GEN results-NOM analyze-do-PAST
“The results of the experiment (was) analysed”
b. Zikken- no kekka-o bunseki-si-ta
experiment-GEN results-ACC analyze-do-PAST
“They analysed the results of the experiment”

3. kakunin-suru (confirm)

- a. * Zenin- no isi -ga kakunin-si-ta
all -GEN intention-NOM confirm-do-PAST
“The intention of all the people (was) confirmed.”
b. * Zenin- no isi -o kakunin-si-ta
all -GEN intention-ACC confirm-do-PAST
“They confirmed the intention of all the people”

4. kenkyu-suru (study)

- a. * Iruka -no koudou -ga kenkyu-si-ta
dolphin-GEN behaviour-NOM study-do-PAST
“The behaviour of dolphin (was) studied”
b. * Iruka -no koudou -o kenkyu-si-ta
dolphin-GEN behaviour-ACC study-do-PAST
“They studied the behaviour of dolphin”

5. touron-suru (discuss)

- a. * Derekita mondai -ga touron-si-ta
come out problem-NOM discuss-do-PAST
The problem occurred (was) discussed.
b. * Derekita mondai -o touron-si-ta
come out problem-ACC discuss-do-PAST
They discussed the problem occurred.

<Psych-verbs >

1. odoroku (surprise)

- a. Watasi wa kodomo-no himei ni doroi-ta
“I was surprised at the child’s scream”
b. * Kodomo -no himei-ga watasi o odoroi-ta
“The child’s scream surprised me”
c. Kodomo-no himei-ga watasi o odorok-ase-ta

“The child scream made me surprised”

2. otikomu (disappoint)

- a. Kare wa siken-no kekka ni otikon-da
“He was disappointed at the results of the exams.”
- b. *Siken-no kekka-ga kare o otikon-da
“The results of the exams disappointed him”.
- c. Siken-no kekka-ga kare o otikom-ase-ta
“The results of the exams made him disappointed him”

3. iratuku (irritate)

- a. Kanozyo wa kuruma-no zyuutai ni iratui-ta
“She was irritated at the traffic jam”
- b. *Kuruma-no zyuutai-ga kanozyo o iratui-ta
“The traffic jam irritated her”
- c. Kuruma-no zyuutai-ga kanozyo o iratuk-ase-ta
“The traffic jam made her irritated”

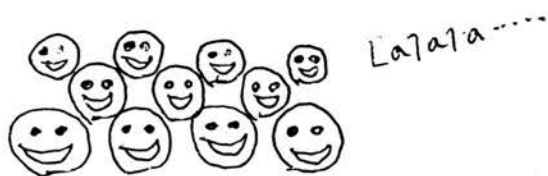
4. okoru (offend)

- a. Sensei wa seito-no itazura ni okot-ta
“The teacher was offended at the mischief”
- b. *Seito-no itazura-ga sensei o okot-ta
“The mischief offended the teacher”
- c. Seito-no itazura-ga sensei o okora-se-ta
“The mischief made the teacher offended”

5. nayamu (annoy)

- a. Kare wa tagaku-no syakkin ni nayan-da
“He was annoyed by a lot of debt”
- b. *Tagaku-no syakkin-ga kare o nayan-da
“A lot of debt annoyed him”
- c. Tagaku-no syakkin-ga kare o nayam-ase-ta
“A lot of debt made he annoyed”

つぎの絵をみて、絵が下の文章を正しく表わしていると思うものには“true”、正しく表わしていないと思われるものには“false”に丸をつけて下さい。解答用紙の同じ番号の所に記入をおねがいします。



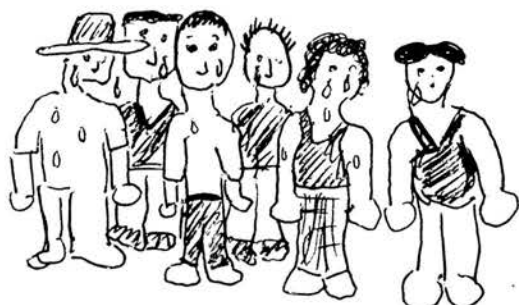
1. たくさん 歌いました。



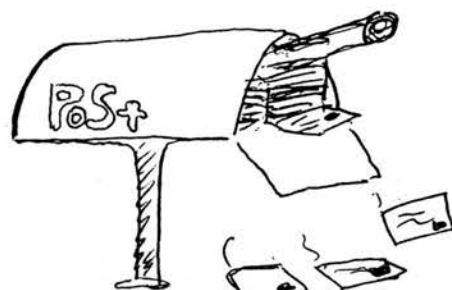
2. たくさん 泳ぎました。



3. たくさん しおれました。



4. たくさん 汗ばみました。



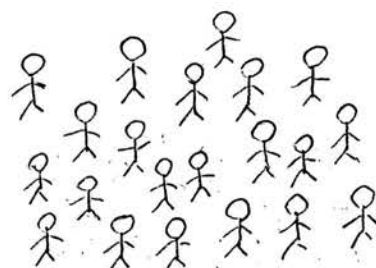
5. たくさん 着きました。



6. たくさん ^{かがや} 輝きました。



7. たくさん 震えました。



8. たくさん いました。



9. たくさん 泳ぎました。



10. たくさん 汗ばみました。

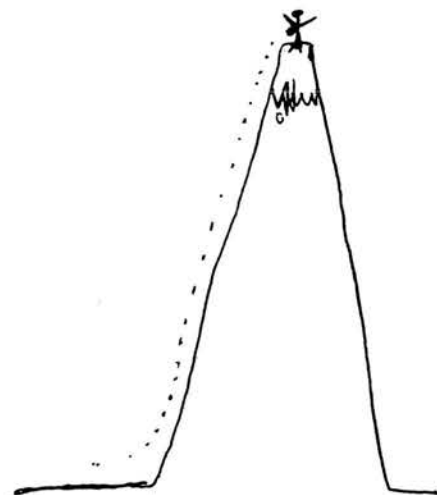
Ness



11. たくさん 現われました。



12. たくさん 着きました。



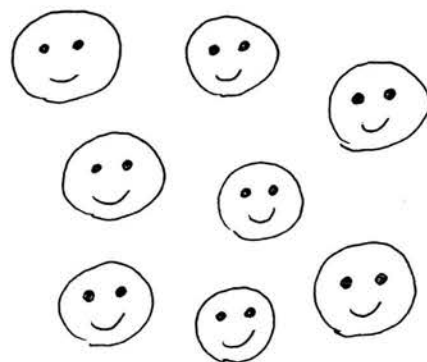
13. たくさん 登りました。



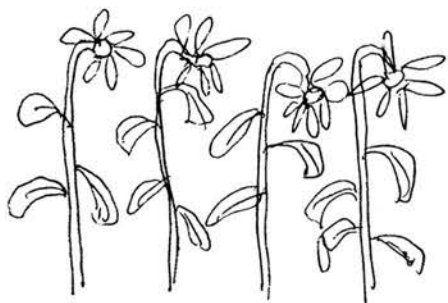
14. たくさん 残りました。



15. たくさん 震えました。



16. たくさん 喜びました。



17. たくさん しおれました。



22. たくさん 残りました。

Ness



18. たくさん 現われました。

23. たくさん ^{かがや} 輝きました。

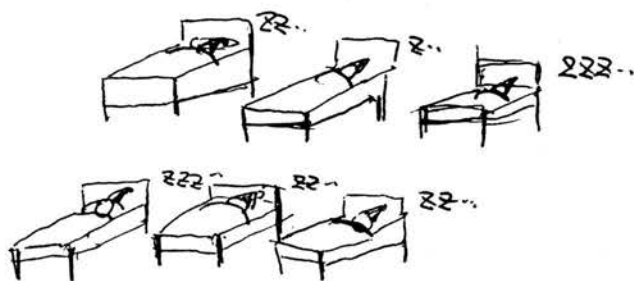
19. たくさん 登りました。



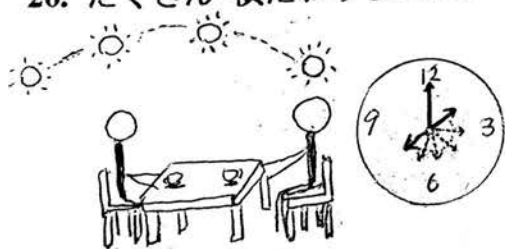
24. たくさん 歌いました。



20. たくさん 横たわりました。



25. たくさん 横たわりました。



21. たくさん いました。



26. たくさん 喜びました。

Experiment II: Magnitude Estimation Task (original for OHP)

1. 彼は試験の結果に落ち込んだ
2. 大学を別の町に移動した
3. 待ちかけの患者
4. 先生は生徒のいたずらにおこった
5. 電気の工事を開始した
6. 泳ぎかけの水泳選手
7. 2つの化学物質を分解した
8. 歌いかけの少女
9. 会議を長い間 継続した
10. 結婚式の日を決定した
11. 遊びかけの子供
12. 夏の交通安全運動を終了した
13. 細胞を大きく拡大した
14. 残りかけの傘
15. 試験の結果が彼を落ち込んだ
16. 大学が別の町に移動した
17. 汗ばみかけの生徒
18. ロケットの打上げが延期した
19. 喜びかけの学生
20. せき込みかけの病人
21. 嵐で船の運行が停止した
22. 会議が長い間 継続した
23. 走りかけの少年
24. 結婚式の日を決定した
25. 光りかけのヘッドライト
26. 輝きかけの流れ星
27. 臭いかけの卵
28. 実験の結果を分析した
29. 吐きかけの酔っ払い
30. 出てきた問題が討論した
31. 子供の悲鳴が私を驚いた
32. ロケットの打上げを延期した
33. 登りかけの登山者
34. イルカの行動が研究した
35. 電気の工事が開始した
36. 進みかけの軍隊
37. 上がりかけの風
38. 思われかけの事実
39. 世界で平和運動を実施した
40. 時代遅れの習慣を廃止した
41. 彼女は車の渋滞にいらついた
42. 続きかけの講義
43. 車の渋滞が彼女をいらついた

- 44.来かけのバス
- 45.2つの化学物質が分解した
- 46.現われかけのうさぎ
- 47.生じかけの問題
- 48.嵐で船の運行を停止した
- 49.去りかけの客
- 50.生徒のいたずらが先生をおこらせた
- 51.細胞が大きく拡大した
- 52.横たわりかけの老人
- 53.もたれかけの学生
- 54.全員の意志が確認した
- 55.しゃがみかけの子供
- 56.朽ちかけの橋
- 57.多額の借金が彼を悩んだ
- 58.存在しかけの神
- 59.起こりかけの事件
- 60.世界で平和運動が実施した
- 61.震えかけの少女
- 62.揺れかけのスケーター
- 63.生徒のいたずらが先生をおこった
- 64.実験の結果が分析した
- 65.ぐらつきかけの体操選手
- 66.全員の意志を確認した
- 67.要りかけの卵
- 68.留まりかけの客
- 69.イルカの行動を研究した
- 70.まにあいかけの卵
- 71.出てきた問題が討論した
- 72.私は子供の悲鳴に驚いた
- 73.ありかけのケーキ
- 74.車の渋滞が彼女をいらつかせた
- 75.腐りかけの卵
- 76.しおれかけのバラ
- 77.時代遅れの習慣が廃止した
- 78.夏の交通安全運動が終了した
- 79.歩きかけの老人
- 80.彼は多額の借金に悩んだ
- 81.試験の結果が彼を落ち込ませた
- 82.子供の悲鳴が私を驚かせた
- 83.多額の借金が彼を悩ませた
- 84.着きかけの電車

1. true / false	1. _____	29. _____	57. _____
2. true / false	2. _____	30. _____	58. _____
3. true / false	3. _____	31. _____	59. _____
4. true / false	4. _____	32. _____	60. _____
5. true / false	5. _____	33. _____	61. _____
6. true / false	6. _____	34. _____	62. _____
7. true / false	7. _____	35. _____	63. _____
8. true / false	8. _____	36. _____	64. _____
9. true / false	9. _____	37. _____	65. _____
10. true / false	10. _____	38. _____	66. _____
11. true / false	11. _____	39. _____	67. _____
12. true / false	12. _____	40. _____	68. _____
13. true / false	13. _____	41. _____	69. _____
14. true / false	14. _____	42. _____	70. _____
15. true / false	15. _____	43. _____	71. _____
16. true / false	16. _____	44. _____	72. _____
17. true / false	17. _____	45. _____	73. _____
18. true / false	18. _____	46. _____	74. _____
19. true / false	19. _____	47. _____	75. _____
20. true / false	20. _____	48. _____	76. _____
21. true / false	21. _____	49. _____	77. _____
22. true / false	22. _____	50. _____	78. _____
23. true / false	23. _____	51. _____	79. _____
24. true / false	24. _____	52. _____	80. _____
25. true / false	25. _____	53. _____	81. _____
26. true / false	26. _____	54. _____	82. _____
27. true / false	27. _____	55. _____	83. _____
28. true / false	28. _____	56. _____	84. _____

A.3 Experiment III

Preference task (test sentences)

Read each sentence in Japanese and choose the English sentence which seems to be the most appropriate translation. There will not necessarily be only one correct answer. Both or none could be correct. Please indicate whether you think both sentences are correct, only one is correct, or neither is correct, for example,

Example 1: Taro wa Hanako ga sukida

a. Taro likes Hanako.

b. Hanako likes Taro.

only a is right only b is right both right both wrong

Example 2: Taro wa Hanako ga kiraida

a. Hanako dislikes Taro.

b. Hanako does not like Taro.

only a is right only b is right both right both wrong

-Unergative verbs-

<Controlled non-motional process>

hanasu (talk)

--This sentence is about **LECTURERS**--

1. Takusan hanasita

a. A lot of lecturers talked.

b. A lecturer talked a lot.

asobu (play)

-This sentence is about **CHILDRENS**-

2. Takusan asonda

a. A lot of children played.

b. A child played a lot.

<Controlled motional process>

hashiru (run)

-This sentence is about **RUNNERS**-

3. Takusan hashitta

a. A lot of runners ran.

b. A runner ran a lot.

aruku (walk)

-This sentence is about **GIRLS**-

4. Takusan aruita

a. A lot of girls walked.

b. A girl walked a lot.

<Uncontrolled process-bodily function>

sekikomu (cough)

-This sentence is about **OLD MAN**-

5. Takusan sekikonda

a. A lot of old men coughed.

b. An old man coughed a lot.

haku (vomit)

-This sentence is about **PATIENTS**-

6. Takusan haita

a. A lot of patients vomited.

b. A patient vomited a lot.

<Uncontrolled process-involuntary reaction>

hurueru (shiver)

-This sentence is about **HOMELESS PEOPLE-**

7. Takusan hurueta

- a. A lot of homeless people shivered.
- b. A homeless person shivered a lot.

guratuku (waver)

-This sentence is about **GYMNASTS-**

8. Takusan guratuita

- a. A lot of gymnasts wavered.
- b. A gymnast wavered a lot.

<Uncontrolled process-emission>

hikaru (flash)

-This sentence is about **LIGHTS-**

9. Takusan hikatta

- a. A lot of lights flashed.
- b. A light flashed many times.

kagayaku (shine)

-This sentence is about **STARS-**

10. Takusan kagayaita

- a. A lot of stars shone.
- b. A star shone a lot.

-Unaccusative verbs-

<Change of location>

taoreru (fall)

-This sentence is about **TODDLERS-**

11. Takusan taoreta

- a. A lot of toddlers fell.
- b. A toddler fell many times.

kuru (come)

-This sentence is about **GUESTS-**

12. Takusan kokoni kita

- a. A lot of guests came here.
- b. A guest came here a lot.

<Change of condition-directed motion>

sameru (cool)

-This sentence is about **DISHES-**

13. Takusan sameta

- a. A lot of dishes cooled.
- b. A dish cooled a lot.

agaru (rise)

-This sentence is about **KITES-**

14. Takusan agatta

- a. A lot of kites rose.
- b. A kite rose a lot.

<Change of condition-change of state>

kusaru (rot)

-This sentence is about **FRUITS-**

15. Takusan kusatta

- a. A lot of fruits rotted.
- b. A fruit rotted a lot.

sioreru (wilt)

-This sentence is about **PLANT-**

16. Takusan sioreta

a. A lot of plants wilted.

b. A plant wilted a lot.

<Change of condition-appearance>

arawareru (appear)

-This sentence is about **ROCK STARS on the TV programme-**

17. Takusan arawareta

a. A lot of rock stars appeared.

b. One rock star appeared a lot.

okoru (happen)

-This sentence is about **EVENTS-**

18. Takusan okotta

a. A lot of events happened.

b. A event happened many times.

<Condition of pre-existing condition>

todomaru (stay)

-This sentence is about **GUESTS-**

19. Takusan todomatta

a. A lot of guests stayed.

b. A guest stayed for a long time.

tuduku (last)

-This sentence is about **WARS-**

20. Takusan tuduita

a. A lot of wars lasted.

b. A war lasted for a long time.

Kake-constructions

-Unergative verbs-

<Controlled non-motional process>

hanasu (talk)

1. hanashi-kake-no sikaisya

a. A chairperson, halfway talking

b. A chairperson who is about to talk

asobu (play)

2. asobi-kake-no kodomo

a. A child, halfway playing

b. A child who is about to play

<Controlled motional process>

hashiru (run)

3. hasiri-kake-no rikuzyou-sensyu

a. A runner, halfway running

b. A runner who is about to run

aruku (walk)

4. aruki-kake-no roozin

a. An old man, halfway walking

b. An old man who is about to walk

<Uncontrolled process-bodily function>

sekikomu (cough)

- 5. sekikomi-kake-no byoonin
 - a. A patient, halfway coughing
 - b. A patient who is about to cough

haku (vomit)

- 6. haki-kake-no yopparai
 - a. A drunkard, halfway vomiting
 - b. A drunkard who is about to vomit

<Uncontrolled process-involuntary reaction>

hurueru (shiver)

- 7. hurue-kake-no shozyo
 - a. A girl, halfway shivering
 - b. A girl who is about to shiver

guratuku (waver)

- 8. guratuki-kake-no taisou-sensyu
 - a. A gymnast, halfway wavering
 - b. A gymnast who is about to waver

<Uncontrolled process-emission>

hikaru (flash)

- 9. hikari-kake-no heddoraito
 - a. A headlight, halfway flashing
 - b. A headlight which is about to flash

kagayaku (shine)

- 10. kagayaki-kake-no kaityudentou
 - a. A torch, halfway shining
 - b. A torch which is about to shine

-Unaccusative verbs-

<Change of location>

taoreru (fall)

- 11. taore-kake-no ki
 - a. A tree, halfway falling
 - b. A tree which is about to fall

tuku (arrive)

- 12. tuki-kake-no densya
 - a. A train, halfway arriving
 - b. A train which is about to go

<Change of condition-directed motion>

sameru (cool)

- 13. same-kake-no ryoori
 - a. A dish, halfway cooling
 - b. A dish which is about to cool.

agaru (rise)

- 14. agari-kake-no tako
 - a. A kite, halfway rising
 - b. A kite which is about to rise

<Change of condition-change of state>

kusaru (rot)

- 15. kusari-kake-no tamago
 - a. An egg, halfway rotten
 - b. An egg which is about to rot

sioreru (wilt)

16. siore-kake-no bara

- a. A rose, halfway wilted
- b. A rose which is about to wilt

<Change of condition-appearance>

arawareru (appear)

17. araware-kake-no haiyu

- a. An actor, halfway appearing
- b. An actor which is about to appear

okoru (happen)

18. okori-kake-no kotuziko

- a. A car accident, halfway happening
- b. A car accident which is about to happen

<Condition of pre-existing condition>

todomaru (stay)

19. todomari-kake-no kyaku

- a. A guest, halfway staying
- b. A guest who is about to stay

tuduku (last)

20. tuduki-kake-no senso

- a. A war, halfway lasting
- b. A war which is about to last

A. 3 Experiment III

Preference task (original)

Read each sentence in Japanese and choose the English sentence which seems to be the most appropriate translation. There will not necessarily be only one correct answer. Both or none could be correct. Please indicate whether you think both sentences are correct, only one is correct, or neither is correct, for example,

Example 1: 太郎は花子が好きだ

a. Taro likes Hanako.

b. Hanako likes Taro.

only a is right only b is right both right both wrong

Example 2: This sentence is about **MYSELF**

お酒が飲める。

a. The alcohol drink is drinkable.

b. I can drink alcohol.

only a is right only b is right both right both wrong

Now let's start.

-This sentence is about **DISHES**-

1. たくさん冷めた

a. A lot of dishes cooled.

b. A dish cooled a lot.

2. 歩きかけの老人

a. An old man, halfway walking

b. An old man who is about to walk

-This sentence is about **PLANT**-

3. たくさんしおれた

a. A lot of plants wilted.

b. A plant wilted a lot.

4. 咳き込みかけの病人

a. A patient, halfway coughing

b. A patient who is about to cough

-This sentence is about **FRUITS**-

5. たくさん腐った

a. A lot of fruits rotted.

b. A fruit rotted a lot.

6. 話しかけの^{しかいしや}司会者

- a. A chairperson, halfway talking
- b. A chairperson who is about to talk

-This sentence is about **KITES**-

7. たくさん上がった

- a. A lot of kites rose.
- b. A kite rose a lot.

8. 走りかけの^{りくじょうせんしゅ}陸上選手

- a. A runner, halfway running
- b. A runner who is about to run

-This sentence is about **ROCK STARS** on the TV programme-

9. たくさん^{あらわ}現れた

- a. A lot of rock stars appeared.
- b. One rock star appeared a lot.

-This sentence is about **RUNNERS**-

10. たくさん走った.

- a. A lot of runners ran.
- b. A runner ran a lot.

11. 遊びかけの子供

- a. A child, halfway playing
- b. A child who is about to play

-This sentence is about **GUESTS**-

12. たくさんとどまった

- a. A lot of guests stayed.
- b. A guest stayed for a long time.

13. ^{つづ}続きかけの^{せんそう}戦争

- a. A war, halfway lasting
- b. A war which is about to last

14. 起こりかけの^{こうつうじこ}交通事故

- a. A car accident, halfway happening
- b. A car accident which is about to happen

--This sentence is about **LECTURERS**--

15. たくさん話した

- a. A lot of lecturers talked.
- b. A lecturer talked a lot.

16. ^{かがや}輝きかけの^{かいちゅうでんとう}懐中電灯

- a. A torch, halfway shining
- b. A torch which is about to shine

--This sentence is about **CHILDRENS**--

17. たくさん遊んだ

- a. A lot of children played.
- b. A child played a lot.

18. 光りかけのヘッドライト

- a. A headlight, halfway flashing
- b. A headlight which is about to flash

--This sentence is about **GIRLS**--

19. たくさん歩いた

- a. A lot of girls walked.
- b. A girl walked a lot.

20. ^{あらわ}現れかけの^{はいゆう}俳優

- a. An actor, halfway appearing
- b. An actor which is about to appear

--This sentence is about **WARS**--

21. たくさん^{つづ}続いた

- a. A lot of wars lasted.
- b. A war lasted for a long time.

22. ぐらつきかけの^{たいそうせんしゅ}体操選手

- a. A gymnast, halfway wavering
- b. A gymnast who is about to waver

--This sentence is about **OLD MEN**--

23. たくさん^せ咳き^こ込んだ

- a. A lot of old men coughed.
- b. An old man coughed a lot.

24. 吐きかけの酔っぱらい

- a. A drunkard, halfway vomiting
- b. A drunkard who is about to vomit

-This sentence is about **EVENTS**-

25. たくさん起こった

- a. A lot of events happened.
- b. A event happened many times.

26. 震えかけの少女

- a. A girl, halfway shivering
- b. A girl who is about to shiver

-This sentence is about **PATIENTS**-

27. たくさん吐いた

- a. A lot of patients vomited.
- b. A patient vomited a lot.

28. 倒れかけの木

- a. A tree, halfway falling
- b. A tree which is about to fall

-This sentence is about **HOMELESS PEOPLE**-

29. たくさん震えた

- a. A lot of homeless people shivered.
- b. A homeless person shivered a lot.

-This sentence is about **STARS**-

30. たくさん輝いた

- a. A lot of stars shone.
- b. A star shone a lot.

-This sentence is about **GUESTS**-

31. たくさんここに来た

- a. A lot of guests came here.
- b. A guest came here a lot.

32. 着きかけの電車

- a. A train, halfway arriving
- b. A train which is about to go

-This sentence is about **GYMNASTS**-

33. たくさんぐらついた

a. A lot of gymnasts wavered.

b. A gymnast wavered a lot.

34. 冷めかけの料理

a. A dish, halfway cooling

b. A dish which is about to cool.

-This sentence is about **TODDLERS**-

35. たくさん^{たお}倒れた

a. A lot of toddlers fell.

b. A toddler fell many times.

36. 上がりかけの^{たこ}凧

a. A kite, halfway rising

b. A kite which is about to rise

37. 腐りかけの^{たまご}卵

a. An egg, halfway rotten

b. An egg which is about to rot

-This sentence is about **LIGHTS**-

38. たくさん光った

a. A lot of lights flashed.

b. A light flashed many times.

39. しおれかけのバラ

a. A rose, halfway wilted

b. A rose which is about to wilt

40. とどまりかけの^{きやく}客

a. A guest, halfway staying

b. A guest who is about to stay

- [illegible]

2. only a is right only b is right both right both wrong

3. only a is right only b is right both right both wrong

4. only a is right only b is right both right both wrong

5. only a is right only b is right both right both wrong

6. only a is right only b is right both right both wrong

7. only a is right only b is right both right both wrong

8. only a is right only b is right both right both wrong

9. only a is right only b is right both right both wrong

10. only a is right only b is right both right both wrong

11. only a is right only b is right both right both wrong

12. *only* is right, *only* is right, *both* right, *both* wrong

12. $1 \leq i \leq 14$, $1 \leq j \leq 14$, $1 \leq k \leq 14$, $1 \leq l \leq 14$

Abstract The purpose of this study was to determine whether there were differences in the prevalence of self-reported depression between men and women who had been exposed to violence by intimate partners. Data from the National Longitudinal Study of Women's Health are used. Results show that among women who reported exposure to violence by their current or former partner, 10% reported depression compared to 6% of those who did not report exposure to violence. This difference remained significant after controlling for age, education, income, race, marital status, and other factors.

1. $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$ 2. $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$ 3. $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$ 4. $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

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174 Only a is right	Only a is right	Both right	Both wrong
20000	20000	20000	20000

10. Only a is right Only c is right Both right Both wrong

19. Only a is right Only c is right Both right Both wrong

20. Only a is right Only b is right both right both wrong

21. Only a is right Only b is right both right both wrong

22. Only a is right Only b is right both right both wrong

25. only a is right only b is right both right both wrong

24. only a is right only b is right both right both wrong

25. only a is right only b is right both right both wrong

26. only a is right only b is right both right both wrong

27. only a is right only b is right both right both wrong

28. only a is right only b is right both right both wrong

29. only a is right only b is right both right both wrong

30. only a is right only b is right both right both wrong

- | | | | | |
|-----|-----------------|-----------------|------------|------------|
| 31. | only a is right | only b is right | both right | both wrong |
| 32. | only a is right | only b is right | both right | both wrong |
| 33. | only a is right | only b is right | both right | both wrong |
| 34. | only a is right | only b is right | both right | both wrong |
| 35. | only a is right | only b is right | both right | both wrong |
| 36. | only a is right | only b is right | both right | both wrong |
| 37. | only a is right | only b is right | both right | both wrong |
| 38. | only a is right | only b is right | both right | both wrong |
| 39. | only a is right | only b is right | both right | both wrong |
| 40. | only a is right | only b is right | both right | both wrong |

APPENDIX B: Published paper

LEXICAL CONSTRAINTS ON THE ACQUISITION OF SPLIT INTRANSITIVITY

Evidence from L2 Japanese

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This study investigates the acquisition of the unaccusative-unergative distinction in L2 Japanese by English learners. The aim is to establish whether learners of Japanese are sensitive to the lexical-semantic characteristics of verbs in similar ways as learners of Romance languages who were found to follow the Split Intransitivity Hierarchy (Sorace, 1993a, 1995a). Two groups of learners participated in the study, one consisting of learners who had not had any previous exposure to Japanese outside the classroom, and the other consisting of learners at the end of a 9-month period of continuous stay in Japan. A control group of native Japanese speakers also took part in the experiment. Subjects were tested on their knowledge of the different behavior of unaccusative and unergative verbs with respect to quantifier floating (Miyagawa, 1989); the native group was also tested on Case drop (Kageyama, 1993). The results show that both the native and the nonnative speakers are conditioned by the Split Intransitivity Hierarchy in their judgments on unergative verbs; however, their judgments on unaccusative verbs do not pattern according to the predictions. It is argued that this difference stems from the ambiguity of the Japanese input on unaccusative verbs, which are characterized by syntactic optionality.

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The Unaccusative Hypothesis (Burzio, 1986; Perlmutter, 1978) stipulates that across languages intransitive verbs are of two types, called unaccusative and unergative, which have distinct syntactic and semantic properties. The single argument of unaccusative verbs is syntactically equivalent to the direct object of transitive verbs, whereas the single argument of unergative verbs is syntactically equivalent to the subject of transitive verbs; this difference is illustrated by the bracketed phrases in (1).

- (1) a. Unaccusative: _____ [_{VP} V NP]
 b. Unergative: NP [_{VP} V]

The distinction is also systematically related to certain semantic characteristics of the predicate: *Agentivity* tends to correlate with unergativity, and *patienthood* correlates with unaccusativity (Dowty, 1991). The alignment between syntactic and semantic properties, however, is not as perfect as the original formulation of the Unaccusative Hypothesis predicted: A mismatch has often been observed between the semantic components postulated for a verb and the syntactic behavior that might be predicted on the basis of those components. Nevertheless, a substantial body of research has shown that most of the syntactic diagnostics of unaccusativity-unergativity (e.g., auxiliary selection in Italian, impersonal passives in Dutch, resultative constructions in English) tend to identify semantically coherent subsets of verbs (Levin & Rappaport Hovav, 1995). The theoretical challenge has thus become how to single out the syntactically relevant components of meaning in different languages, on the principle that the unaccusative-unergative distinction is syntactically encoded but semantically determined. This principle assumes that a syntactic characterization of unaccusativity is necessary to account for phenomena not easily reducible to semantic explanations, such as the similarity between unaccusatives and passives, the resultative construction in English, or the cliticization of partitive *ne* in Italian. For example, the resultative construction in English is subject to a Direct Object Restriction (see Levin & Rappaport Hovav, 1995); that is, it can be predicated only of a direct object NP governed by the verb, as shown in (2).

- (2) a. Transitive: *John licked his finger clean.*
 b. Unaccusative: *The bottle broke open.*
 c. Unergative: **John shouted hoarse.*¹

The identification of syntactic constraints, however, is not sufficient; it is also crucial to explain how lexical-semantic or aspectual representations underlying individual verbs are mapped onto binary syntactic representations.² Various theories of argument structure (i.e., of the syntactically relevant properties of verb arguments) and event structure (i.e., of the temporal and aspectual organization of the event described by a verb) that have been developed in recent years have set out to pursue this goal (Grimshaw, 1990; van Hout,

1996; Pesetsky, 1995; Pustejovsky & Busa, 1995; Rappaport Hovav & Levin, 1998, among others).

The systematic linking of a multicategorical lexical-semantic level to a necessarily binary syntactic level was also the focus of a series of studies by Sorace and her collaborators (Keller & Sorace, 2000; Sorace, 1993a, 1993b, 1995a, 1995b, 2000a; Sorace & Cennamo, 2000).³ The starting point of these studies is the following facts, which characterize split intransitivity in a number of Western European languages: (a) Across languages some verbs tend to show consistent unaccusative-unergative behavior whereas others do not; and (b) within languages some verbs are invariably unaccusative-unergative regardless of context, whereas others exhibit variation. Sorace's studies provide supporting evidence for these generalizations, mostly based on experiments testing native speakers' intuitions about auxiliary selection (perhaps the best-known diagnostic of unaccusativity) in various languages that have a choice of perfective auxiliaries (French, Italian, Paduan, Dutch, and German). In all these languages, unaccusative verbs select the counterpart of English auxiliary *be* and unergative verbs select the counterpart of auxiliary *have*; however, native intuitions on auxiliaries are more determinate for certain types of verbs and less determinate for others. For example, native speakers have a very strong preference for auxiliary *be* with change of location verbs but express a weaker preference for the same auxiliary (or have no preference at all) with stative verbs. Additionally, Sorace (1995a, 1995b) showed that *ne-cliticization* in Italian displays the same systematic variation as does auxiliary selection.

Sorace's (1995a, 2000a) account of these systematic differences within the syntactic classes of unaccusative and unergative verbs is that gradient dimensions or "hierarchies" exist that distinguish core unaccusative and unergative monadic verbs from progressively more peripheral verbs. These hierarchies, which are based on (potentially universal) aspectual parameters, identify the notion of "telic dynamic change" at the core of unaccusativity and that of "agentive nonmotional activity" at the core of unergativity. The extremes of the hierarchy thus consist of maximally distinct core verbs—verbs of change of location (e.g., *arrive*) and verbs of agentive nonmotional activity (e.g., *work*)—which consistently display unaccusative or unergative characteristics, respectively.⁴ In contrast, peripheral verb types between the extremes are susceptible to variable syntactic behavior.⁵ The overall hierarchy of split intransitivity is represented in Figure 1.

Peripheral verb types include (arranged in order of closeness to the core): verbs denoting indefinite change in a particular direction (e.g., *rise*), change of condition (e.g., *wilt*), appearance (e.g., *appear*), continuation of a preexisting condition (e.g., *stay*), and states (e.g., *exist*, *suffice*).⁶ Peripheral verbs closer to the unergative core include verbs denoting motional processes (e.g., *swim*), and various kinds of uncontrolled processes (such as bodily functions [e.g., *sweat*]), involuntary reaction (e.g., *tremble*) and emission (e.g., *rattle*). The hierarchy does not include dyadic verbs alternating with transitive variants

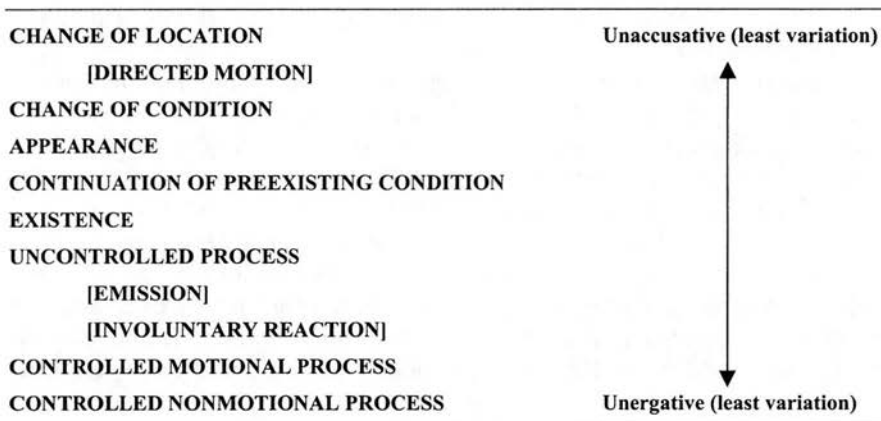


Figure 1. Split intransitivity hierarchy.

(e.g., *break*, *increase*), which are weakly unaccusative and display unergative behavior in some languages (see Sorace, 2000a; Labelle, 1992, on French; Haegeman, 1994, on English).

In common with others (e.g., Levin & Rappaport Hovav, 1995, in press), this lexicon-centered approach assumes that verb classes at the lexical-semantic level are mapped onto argument structure, which in turn projects to the discrete, binary level of syntactic representation. The mapping is achieved by linking rules, which relate portions of the lexical-semantic hierarchy to either external or internal arguments in argument structure; these in turn are projected to the positions of subject or direct object at argument structure, determining the syntactic status of a verb as either unaccusative or unergative. The prediction is that, although mappings may vary across languages because different languages may have different cutoff points along the hierarchy, the mapping of the core verbs to unaccusative or unergative syntax is largely invariant across languages. Note that the hierarchy does not predict that all languages differentiate among all verb classes, but only that there should not be complete reversals of the hierarchical order of verb types (e.g., languages in which stative verbs are core unaccusatives, or verbs denoting involuntary processes are core unergatives). The experimental evidence from European languages in Sorace's (1995a, 2000a) studies has shown that the extent of variation in the syntactic behavior of intransitive verbs, both within and across languages, is a function of the position of a verb in the hierarchical lexical-semantic structures: Gradient variation can in fact be found both in native and in nonnative grammars, as will be shown in this paper.

It may be argued, however, that these gradient phenomena are found only in Western European languages, or even that they characterize only auxiliary selection but not split intransitivity in general.⁷ This paper will offer new evi-

dence on the acquisition of Japanese, a language with very different manifestations of split intransitivity from Western European languages. If similar gradients are found to affect the intuitions of both native and nonnative speakers of Japanese, this would lend support to the hypothesis that this pattern might have wider typological validity, rather than being a peculiarity of a particular language family. Let us first consider how the unaccusative-unergative distinction is manifested in Japanese.

SPLIT INTRANSITIVITY IN JAPANESE

A number of studies in recent years have focused on the characterization of split intransitivity in Japanese. Like the literature on European languages, these studies are differentiated by whether they take a purely syntactic approach (Miyagawa, 1989; Takezawa, 1991), a purely semantic approach (Kishimoto, 1996), or a syntax-semantics interface approach (Kageyama 1993, 1996; Tsujimura 1990a, 1990b, 1990c, 1991, 1994, 1996, 1999). These studies have shown that split intransitivity is manifested in a number of phenomena that distinguish unaccusative and unergative verbs. Six main diagnostics have been discussed in the literature: quantifier floating (Miyagawa) and Case drop (Kageyama, 1993), which are constructions optionally available with unaccusative verbs but not with unergative verbs; the form *takusan* 'a lot,' which can occur with both unaccusative and unergative verbs but with different interpretations; the resultative construction (Tsujimura, 1990a, 1990b, 1994, 1996) and the deverbal nominalization formed with the addition of the prefix *kake* 'half-way, about to' (Kishimoto), which are impossible with unergative verbs and allowed only by a subset of unaccusative verbs; and finally the *te-iru* construction (McClure, 1995; Takezawa), which, similarly to the *takusan* test, is possible with both unaccusative and unergative verbs but is associated with different interpretations. The following sections will focus on quantifier floating, Case drop, and *takusan* diagnostics.⁸ Although only quantifier floating and (to a lesser extent) Case drop are relevant to the experiments reported in this paper, the *takusan* test has been employed in the literature on the L2 acquisition of Japanese and will be referred to below.

Quantifier Floating

The phenomenon known as Quantifier Floating has been analyzed as evidence for a movement analysis of scrambling in Japanese. Miyagawa (1989) claimed that an NP and its numeral quantifier (henceforth NQ) have to be adjacent because they must c-command each other. Compare examples (3) and (4), taken from Culicover (1997).

(3) Unergative:

- a. *Gakusei-ga sannin wazato waratta.*
 student-NOM three intentionally laughed
 'Three students intentionally laughed.'

- b. **Gakusei-ga wazato sannin waratta.*
 student-NOM intentionally three laughed
 "Three students intentionally laughed."
- (4) Unaccusative:
- a. *Gakusei-ga sannin Tokyo-ni tsuita.*
 student-NOM three Tokyo-at arrived
 "Three students arrived in Tokyo."
- b. *Gakusei-ga Tokyo-ni sannin tsuita.*
 student-NOM Tokyo-at three arrived
 "Three students arrived in Tokyo."

In (3a), the NQ *sannin* modifies the subject NP. The sentence is grammatical because both are outside the VP and they c-command each other.⁹ In (3b), the NQ cannot quantify the subject NP because it is inside the VP, so the relationship of mutual c-command does not obtain. Example (4a) is grammatical just like (3a); however, (4b) is also grammatical, in contrast to (3b). Miyagawa explained this phenomenon by positing different syntactic structures for (3) and (4): The surface subject in (3) originates outside the VP (see [5]), but the surface subject in (4) originates in the direct object position (see [6a]) and moves into the subject position, leaving behind a trace (see [6b]). The mutual c-command relationship with the numeral quantifier is maintained in (6b) but not in (5b).

- (5) a. [_{IP} NP NQ [_{VP} V]] (= [3a])
 b. **[_{IP} NP [_{VP} NQ V]] (= [3b])*
- (6) a. [_{IP} [_{VP} NP NQ V]] (= [4a])
 b. [_{IP} NP_i [_{VP} t_i NQ V]] (= [4b])

Thus, the different syntactic behavior of unaccusative and unergative verbs in the presence of quantifier floating is evidence for the existence of syntactic unaccusativity in Japanese.

The *Takusan* Test

Kageyama (1993, 1996) argued that the interpretation of the form *takusan* "a lot" is a reliable diagnostic test of unaccusativity. This form can modify both a subject and an object, as shown in (7a) and (7b) (examples from Hirakawa, 1999).

- (7) a. *Takusan-no hito-ga sono hon-o yon-da.*
 a lot-GEN people-NOM the book-ACC read-PAST
 "A lot of people read the book."
- b. *Tanaka-san-ga takusan-no hon-o yon-da.*
 Tanaka-Mr.-NOM a lot-GEN book-ACC read-PAST
 "Mr. Tanaka read a lot of books."

When the subject is null, the form can have two different functions: It can be a quantified NP, as in (8a), or an adverb, as in (8b).

- (8) a. *Takusan yon-da.*
 a lot read-PAST
 "He (she, they, etc.) read a lot."
 b. *Takusan naita.*
 a lot cry-PAST
 "He (she, they, etc.) cried a lot."

The relevant contrasts are manifested when *takusan* occurs with intransitive verbs: It is interpreted as a subject NP with unaccusatives but as an adverbial modifier of the verb with unergatives. This is shown in (9).

- (9) a. *Takusan tuita.*
 a lot arrived
 "A lot of people arrived."
 b. *Takusan oyoida.*
 a lot swam
 "We (they, he, etc.) swam a lot." (not: *A lot of people swam.)

Kageyama (1993) proposed that *takusan* is generated within the VP and modifies only an internal argument. Example (9a) is grammatical under the interpretation in which *takusan* is a quantified NP because the apparent subject of the unaccusative verb is an internal argument, which is generated within the VP and (according to Kageyama) stays within it, therefore receiving Case. It should be noted, however, that sentences such as those in (8) and (9) are heavily dependent on context for their interpretation and would be unlikely to occur outside a context that can disambiguate them.

Case Drop

In Japanese, every NP is marked with a case particle. There are five main case particles: the nominative *ga*, the accusative *o*, the dative *ni*, the genitive *no*, and the topic *wa*. The nominative *ga* occurs with the subject, whereas the accusative *o* occurs with the direct object, as shown in (10).

- (10) a. *Mary-ga uta-o utat-ta.*
 Mary-NOM song-ACC sing-PAST
 "Mary sang a song."
 b. *Mary-ga oyoi-da.*
 Mary-NOM swim-PAST
 "Mary swam."

The subject of unaccusative verbs is also marked by the nominative case *ga*, as in (11).

- (11) *Fune ga shizun-da.*
 boat-NOM sink-PAST
 "The boat sank."

The phenomenon of Case drop occurs when case markers are omitted in informal speech.

The accusative case marker *o* can be dropped in transitive sentences, as shown in (12). There is a difference of behavior in Case drop between unaccusative and unergative constructions. Compare examples (13) and (14) (from Kageyama, 1993, p. 56). (NOML indicates a nominal marker, and Q indicates a question marker.)

- (12) a. *Kodomo-tachi* *(*ga*) *hon* (*o*) *yomu no mi-ta koto nai*.
 child-PL NOM book (ACC) read NOML see-PAST thing not-be
 "I have never seen the children reading books."
 b. *Kono chikaku ni tabako* (*o*) *utteru mise ari-masen-ka*.
 this near by cigarette (ACC) sell shop be-NEG-Q
 "Is there any shop nearby that sells cigarettes?"
- (13) a. *Kanja*-(*ga*) *abare-ta no shitte-imasu-ka*.
 patient-NOM become-violent-PAST NOML know-be-Q
 "Do you know that the patient became violent?"
 b. *Tanaka-kun*-(*ga*) *shigoto-suru no mi-ta koto nai*.
 Tanaka-title-NOM work-do NOML see-PAST thing not be
 "I have never seen Mr. Tanaka working."
- (14) a. *Kootuu-jiko*-(*ga*) *okoru no mi-ta koto aru*.
 traffic accident-(NOM) happen NOML see-PAST thing be
 "Have you ever seen traffic accidents happen?"
 b. *Ano kodomo nando de oyu*-(*ga*) *waku-ka shira-nai*.
 that child what-degree at hot water-(NOM) boil-whether know-NEG
 "That child doesn't know what degree water boils at."

The nominative case marker *ga* is obligatory in transitive and unergative constructions (cf. [12]–[13]), whereas it can be omitted in unaccusative structures (cf. [14]), confirming the familiar parallelism between the subject of unaccusatives and the object of transitive verbs. Note, however, that this phenomenon is not widespread. It is subject to regional variation (with some speakers never producing it) and it definitely belongs to an informal register.

Applicability of the Split Intransitivity Hierarchy to Japanese

As mentioned before, research on the Split Intransitivity Hierarchy has been conducted exclusively on European languages. There is currently no experimental evidence that the hierarchy is applicable to typologically different languages. Because the decision to test the hierarchy on Japanese is logically dependent on the hypothesis that the generalizations embodied by it might be extended to this language, this hypothesis requires some independent justification.

There are three pieces of evidence that make the hypothesis defensible. First, research on syntax-semantics correspondences suggests that certain verb classes are remarkably uniform in their argument realization, whereas other verb classes are susceptible to optional argument realizations, both crosslin-

guistically and within individual languages (see Levin & Rappaport Hovav, in press, for discussion). This fact, as mentioned before, was one of the motivating factors for postulating the Split Intransitivity Hierarchy. Whether it is the same verbs that are uniform or variable in Japanese (as appears to be the case in European languages) is therefore a legitimate research question.

Second, the existing research on Japanese indicates that this language is not widely different from other languages in the way it encodes the syntactic reflexes of aspectual distinctions. McClure (1995), in his detailed comparison of aspect and unaccusativity in Japanese and Italian, concluded that in both languages unaccusative verbs can only be achievements or states, although not all achievements and states are unaccusatives. In both languages, stative verbs are the most susceptible to variable behavior because they have an unspecified aspectual structure, which can be expanded into activities or achievements, depending on the contribution of other contextual or sentential factors. These verbs are therefore compatible with both unaccusative and unergative syntax. In contrast, achievements are aspectually stable. This view is also argued for by Rappaport Hovav and Levin (1998), who proposed that certain verbs show more "elasticity of meaning" because their event structure template may be augmented (i.e., more complex templates can be built on simpler ones), as long as certain conditions on syntactic realization are met.¹⁰ Again, state templates can be freely augmented (e.g., to derive achievements), giving rise to systematic ambiguities between change-of-state and be-in-state interpretations (e.g., *The plant bloomed for two weeks*, *The plant bloomed overnight*). Thus, although it is clear that not all languages are the same in their choice of semantic determinants of unaccusativity, it is plausible to expect that differences will be more prominent in verb classes that, because of their aspectual characteristics, have independently been shown to be prone to multiple classifications. This claim is consistent with the Split Intransitivity Hierarchy, which assumes that languages may have different cutoff points along the hierarchy.

Third, the two semantic determinants of unaccusativity that have been discussed in the literature on Japanese are volitionality and telicity. Volitional control has been argued to be the main semantic determinant of split intransitivity in Japanese (see Kishimoto, 1996). Telicity has been shown to cause event-type shifts from activity readings to achievement readings, which affect the syntactic behavior of unergative verbs denoting manner of motion. Tsujimura (1994) showed that the presence of the goal phrase *made* "as far as" with manner of motion verbs turns the predicate into a resultative construction that describes a change of location. This resultative predicate satisfies unaccusativity diagnostics such as quantifier floating (QF), as shown in (15). (CL indicates a classifier.)

(15) a. QF impossible:

**Kodomo-ga inu-to awatete san-nin hasitta.*
 child-NOM dog-with hurriedly three-CL run
 "Three children ran hurriedly with a dog."

- b. QF possible:

Kodomo-ga inu-to awatete san-nin kooen-made hasitta.
 child-NOM dog-with hurriedly three-CL park-as-far-as run
 "Three children ran hurriedly to the park with a dog."

The Split Intransitivity Hierarchy also assumes that telicity and agentivity are the crucial semantic determinants of unaccusativity and unergativity, respectively.

To summarize, the available evidence from research on syntax-semantic correspondences and split intransitivity in Japanese is consistent with the predictions of the Split Intransitivity Hierarchy. It is of course possible that Japanese may weigh these components differently from European languages, that it may combine verb classes or make finer distinctions within verb classes, but these differences can be discovered only by testing the hierarchy. It seems therefore legitimate to assume, as a working hypothesis, that the hierarchy affects split intransitivity in Japanese.

Diagnostics of Split Intransitivity and Available Evidence

This brief overview of split intransitivity in Japanese has revealed that the syntactic diagnostics of the distinction generally consist in optional constructions that are possible with unaccusative verbs but not with unergative verbs. Japanese unaccusative verbs are not unambiguously identifiable by the presence of morphosyntactic markers (such as auxiliary BE in Italian and Dutch). They may appear in sentences with floated numeral quantifiers, but they are also grammatical without QF; they may occur with Case drop in informal speech, but they also occur without Case drop. There are no obligatory markers of unaccusativity, nor are there obligatory markers of unergativity. Unergativity is defined negatively by what is not possible: QF and Case drop are not permissible. Learners of Japanese have to learn that a wider range of sentences are grammatical with unaccusative verbs than with unergative verbs. In other words, they have to notice optionality in the input and make it part of their interlanguage grammar. In some respects, their situation is similar to that of L2 learners of English, who also do not get overt and systematic evidence about unaccusativity in the input.¹¹

This optionality raises some interesting learnability questions. What evidence does the learner rely on to acquire the distinction? Is there a difference between the learners of L2 Italian, who receive unambiguous evidence for the unaccusative-unergative distinction, and the learners of L2 Japanese, who do not? This question is relevant to much research on the acquisition of split intransitivity to date.

THE L2 ACQUISITION OF SPLIT INTRANSITIVITY

Research on the L2 acquisition of split intransitivity has been mostly concerned with English and, to a lesser extent, other European languages such as

French, Italian, Spanish, and Turkish. Recently, split intransitivity in non-Indo-European languages has become an object of investigation; a number of studies have appeared on Chinese and Japanese, which are particularly relevant to the present investigation.

Three aspects have received particular attention: (a) the production of passive unaccusatives in L2 English, (b) the transitive-inchoative alternation with dyadic verbs, and (c) the lexical-semantic features of unaccusative and unergative verbs and their mapping onto syntactic configurations. The studies on passive unaccusatives focus on a phenomenon first described by Zobl (1989), which consists of errors such as the ones in (16) typically produced by Japanese and Korean learners of English.

- (16) a. *The most memorable experience of my life was happened last year.*
 b. *My mother was died when I was a baby.*

Another typical pattern of errors involves the production of the subject of intransitive verbs in postverbal position, with or without an expletive subject. These errors tend to be produced by Spanish and Italian learners (the examples in [17] are from Oshita, 1998) but are also exhibited by Arabic learners (Rutherford, 1989).

- (17) a. *It existed a lot of restrictions.*
 b. *One day happened a revolution.*

In the vast majority of cases, these errors involve unaccusative verbs, many of which are monadic at argument structure and denote a state or a change of state.

Zobl's (1989) account of the pattern of errors in (16) attributed it to the learners' overgeneralization of the passive construction, in which an NP that originates as a direct object moves to the subject position at S-structure (see also Balcom, 1997). Crucial to this account is the assumption that learners realize that the subject of unaccusative verbs is a direct object or, in other words, that learners recognize the unaccusative-unergative distinction in English, despite the relative poverty of overt morphosyntactic manifestations. This realization, however, may not take place in the early stages of interlanguage development. Oshita (1998) proposed the Unaccusative Trap Hypothesis to account for both passivized unaccusatives and postverbal subjects with unaccusative verbs. The hypothesis assumes a developmental path from an initial stage in which learners assign an external argument to both unaccusatives and unergatives (and thus in effect do not recognize the distinction), to an intermediate stage in which they (a) discover that unaccusatives do not have an external argument and (b) attempt to mark them by overt morphosyntax in ways that are partly language specific. Oshita argued that the third stage, which involves the acquisition of nativelike knowledge, is, in all likelihood, very seldom attained.

A different analysis of the interlanguage phenomenon in (16) is argued for by Yip (1995), who maintained that passive unaccusatives result from the learners' attempt to extend causativization to all unaccusative verbs. According to this account, learners notice the existence of patterns such as *The shop increased the prices* versus *The prices increased* in the input, which is exhibited only by a subset of verbs denoting change of state brought about by a causer that can be left unspecified (see Levin & Rappaport Hovav, 1995); they then overgeneralize this pattern to nonalternating verbs, creating ungrammatical verbal passives. As Oshita (2000) rightly noted, however, this analysis would need to be corroborated by the existence of passive unaccusative sentences in which the *by*-phrase is maintained (as in *a nice thing was happened by John*). The scarcity of such data, and the fact that most passivized unaccusatives have stative meanings or denote events that do not have an identifiable causer, considerably weakens the hypothesis.

Montrul (1997, 1999) investigated the acquisition of the transitivity alternation in three languages—English, Spanish, and Turkish—each learned by the other two groups. She pointed out that the task faced by L2 learners is to determine (a) the components of meaning that distinguish the verbs participating in the alternation from the verbs excluded from it, as well as the mechanisms through which these components are projected onto argument structure, and (b) the morphosyntactic manifestations of the alternation in the particular language they are acquiring. The transitivity alternation is a prime example of noncanonical argument realization and is particularly marked in English because both members are morphologically identical, unlike Spanish and Turkish in which one of the variants is morphologically marked. The adult learners in Montrul's study, just like child acquirers, tended to causativize intransitive verbs to a significantly greater extent than they anticausativized transitive verbs. Montrul's explanation for this asymmetry is that the learners' initial hypothesis is a "default transitive template," which has all arguments in canonical positions and which is overgeneralized to nonalternating verbs. Like Yip (1995), Montrul assumed that passive unaccusatives result from treating unaccusatives as if they were transitive. However, it may be argued that these errors derive from learners' attempts to mark unaccusativity with overt morphosyntax. Montrul's data do in fact show that L2 learners prefer overt morphological marking with alternating intransitives, although this preference manifests itself in L1-specific ways. For example, Spanish learners of English accept the *get* construction with alternating verbs (e.g., *the window got broken*) more often than Turkish learners, and Turkish learners are more sensitive to the Spanish reflexive markers with intransitive alternating verbs than English learners.

The generalization that can be drawn by research on the acquisition of English unaccusatives is that learners are aware of the unaccusative-unergative distinction, but are confused by the evidence they receive in the input and by the lack of overt unambiguous markers.¹² A similar situation seems to obtain

with learners of other languages in which the evidence for split intransitivity is ambiguous.

Yuan (1996) conducted a study on the acquisition of unaccusativity in Chinese L2 by English-speaking learners. The only syntactic manifestation of the distinction in Chinese is the optional occurrence of the subject of unaccusative verbs in postverbal position; their appearance in this position is further conditioned by the constraint that the NP must be indefinite. The subject of unergative verbs, in contrast, can only appear in preverbal position. However, unergative verbs shift to unaccusative behavior in the presence of a telic expression, as in many other languages. This contrast is shown in (18) and (19) (examples from Yuan). (PF indicates a perfective marker.)

- (18) a. *shang ge yue, san sou chuan zai zhe ge hai yu chen le.*
 last CL month three CL ship in this CL sea area sink PF
 "Last month, three ships sank in this part of the sea."
 b. *shang ge yue, zai zhe ge hai yu chen le san sou chuan.*
 last CL month in this CL sea area sink PF three CL ship
 "Last month, three ships sank in this part of the sea."
- (19) a. *ji ge haizi zai chuang shang tiao.*
 a few children in bed on jump
 "A few children jumped on the bed."
 b. **zai chuang shang tiao ji ge haizi.*
 in bed on jump a few children
 "A few children jumped on the bed."

Chinese is therefore, like Japanese, a language in which the syntactic manifestations of unaccusativity are optional: Unaccusative verbs appear both with subjects in preverbal position and with subjects in postverbal position, and learners get evidence of both constructions. Yuan's (1996) results showed that the majority of subjects in the advanced group (which included some very proficient learners) still have indeterminate judgments about unaccusative verbs: They tend to either accept postverbal subjects with unergative verbs, and with definite subjects of unaccusative verbs, or to reject postverbal subjects across the board.

A recent study on unaccusativity in Japanese was conducted by Hirakawa (1999). A picture verification task and an acceptability judgment test were employed to test English-speaking learners' knowledge of two syntactic diagnostics of unaccusativity: the scope of *takusan* in sentences with null subjects, such as in (8) and (9), and Case drop, which Hirakawa regarded as diagnostics of deep and surface unaccusativity, respectively. The prediction was that the syntactic manifestation of deep unaccusativity would be easier to acquire than that of surface unaccusativity. Hirakawa's results, however, do not present a clear-cut picture. Neither the learners nor the Japanese controls responded as expected on the Case drop test. Native Japanese speakers on the whole tended to reject Case drop with both unergative and unaccusative verbs. The performance on the *takusan* test, although overall more determi-

nate, was to some extent problematic. Several subjects from all groups, including the controls, had to be eliminated because they did not distinguish between (grammatical) *takusan* modifying the direct object of transitive sentences and (ungrammatical) *takusan* modifying the subject of transitive verbs. Of the remaining subjects, many accepted *takusan* as a modifier of the subject of unergative verbs, although on the whole they preferred it as a modifier of the subject of unaccusative verbs.

In sum, both Yuan's (1996) and Hirakawa's (1999) results suggested that learners of languages in which split intransitivity is not overtly and unambiguously marked in the input are aware of the distinction, but have protracted difficulty in learning precisely how unaccusatives and unergatives are differentiated syntactically. The question arises whether, in such a situation, learners would resort to semantic evidence in the process of acquiring the distinction. Would the lexical-semantic features of particular verbs facilitate their classification as unergative or unaccusative?

This question was addressed in a series of studies by Sorace (1993a, 1993b, 1995a, 1995b, 1996, 2000a), which investigated the influence of lexical-semantic features on the acquisition of the syntax of split intransitivity in Italian and French. These studies, based on the Split Intransitivity Hierarchy described earlier, demonstrate that two of the main syntactic manifestations of the unaccusative-unergative distinction in Italian—auxiliary selection and *ne*-cliticization—are lexically constrained and tend to be acquired in a gradient fashion, starting with core unaccusative verbs and gradually spreading to other peripheral verbs. They also show that the distinction is easier to acquire in a language such as Italian, which presents robust and unambiguous evidence, at least with core verbs, in the form of different auxiliaries selected by the two classes of intransitives. French, in contrast, is more opaque and offers more ambiguous and less systematic evidence for the distinction, and, as a result, the distinction is more difficult to acquire. However, Italian peripheral unaccusative and unergative verbs, which are less consistent and often display optionality in auxiliary selection, also cause more difficulty to learners of Italian L2 and are typically acquired at a later developmental stage. Therefore, ease or difficulty in the acquisition of split intransitivity seems to be determined by two factors: on the one hand, the interplay of semantic components and syntactic manifestations; on the other hand, the robustness and lack of ambiguity of the evidence for the distinction.

THE EXPERIMENT

This study aims to explore the interplay of these factors in the acquisition of split intransitivity in L2 Japanese. The research questions investigated were the following:

1. Will L2 learners of Japanese display a differential sensitivity to the unaccusative-unergative distinction depending on the position of monadic verbs on the Split Intransitivity Hierarchy?

2. Will L2 learners of Japanese show more sensitivity to unergative syntactic behavior with verbs denoting nonmotional processes and less sensitivity with verbs denoting involuntary processes? Will they display more sensitivity to unaccusative syntactic behavior with verbs denoting change of location and less sensitivity with stative verbs?

Recall that unaccusativity in Japanese is manifested in the grammaticality of some optional constructions, which are ungrammatical with unergative verbs. In operational terms, the research questions stated above thus predict that (a) learners would show a stronger preference for grammatical sentences over ungrammatical sentences with core unergative verbs, and a weaker preference with peripheral unergative verbs; and (b) learners would be better able to recognize the grammaticality of optional constructions with core unaccusative verbs than with peripheral unaccusative verbs.

Subjects

A total of 60 subjects participated in the study: a group of 29 adult native speakers of English who had just started a 9-month Japanese course at an institution in Osaka (postbeginners, henceforth Group 1), and a group of 31 adult native speakers of English who had almost completed a 9-month Japanese course offered at three different institutions in Tokyo (intermediate, henceforth Group 2). The study was conducted at different places because of constraints on the availability of adult native speakers of English who shared a similar background concerning their prior experience with Japanese. All subjects filled in a background questionnaire. Subjects ranged in age between 20 and 27 years; all of them had learned Japanese in a classroom setting at least for two years but with little exposure to Japanese outside the school setting until they came to study in Japan. The difference between Group 1 and Group 2 therefore is that the former had had no previous exposure to Japanese in Japan, whereas the latter had just had a 9-month period of continuous exposure to the language. A control group of 12 native speakers of Japanese (henceforth Group 3) also participated in this study. The controls were tested first and on a wider range of constructions (see section entitled "Materials").

At the beginning of the experiment, all subjects in Groups 1 and 2 took a vocabulary test, aimed to ascertain their familiarity with the lexical items in the task, and a cloze test, designed to ensure that they were at two different levels of proficiency. The cloze test consisted of a short passage in Japanese with six blanks, obtained by deleting every ninth word. Multiple choices were provided for each blank, of which only one was correct. Subjects were asked to choose the appropriate word among those provided. Because of time constraints, the vocabulary test consisted of only 10 of the verbs used as experimental items. Subjects were asked to match each verb with its meaning, provided in English. The results of these tests are shown in Table 1. The analysis of the results shows a significant difference between the two groups in

Table 1. Results of the cloze test and vocabulary test

Group	Cloze test		Vocabulary test	
	Mean	SD	Mean	SD
1 ($n = 29$)	2.62	0.78	8.69	2.27
2 ($n = 31$)	3.26	0.86	9.23	1.78

the cloze test ($t = 3.02$, $p < .004$), confirming that they are different in proficiency. No significant difference was found in the vocabulary test ($t = 1.02$, $p < .31$, *ns*), on which both groups obtained high scores.

Experimental Method

The technique used for the elicitation of acceptability judgments was magnitude estimation (ME), a method originally developed in psychophysics and recently applied to the measurement of linguistic acceptability (Bard, Robertson, & Sorace, 1996; Sorace, 1996). The technique consists of asking subjects to assign any number to the first sentence and then to assign proportional numbers to successive sentences, so as to reflect the perceived degree of acceptability of each sentence with respect to the first one. For example, if a sentence appears to be 10 times as acceptable as the previous one, it should be given a number 10 times as large. Higher numbers correspond to more acceptable sentences. Compared with conventional category rating scales, ME yields data on an interval scale and gives subjects the freedom to set up their own range and categories of judgments, thus enabling them to make finer distinctions in their judgments (see Bard, Robertson, & Sorace; and Sorace for details).¹³

Materials

A total of 134 sentences were presented, consisting of 30 sentences with unergative verbs, 40 sentences with unaccusative verbs, and 64 sentences that included other types of constructions that will not be discussed in this paper. Three verbs from each of the categories along the Split Intransitivity Hierarchy were employed.¹⁴ These verbs are presented in Appendix A.

The native controls were tested on two diagnostic tests: Quantifier Floating (QF) and Case Drop (CD). Their performance on the CD test revealed that the natives generally did not accept this construction as optionally possible with any verb category (see Table 2).¹⁵ It was therefore decided to test the learners' knowledge of QF only. For each unergative verb, there was a grammatical sentence without QF ([−QF]) and an ungrammatical sentence with QF ([+QF]). For each unaccusative verb, there were two grammatical [+QF] and [−QF] sen-

Table 2. Group 3 (natives): Mean acceptability judgments on Case drop sentences

Verb types	Non-Case drop		Case drop	
	Mean	SD	Mean	SD
Unergative				
Nonmotional process	2.96	1.12	2.33	1.12
Motional process	2.77	1.22	2.10	1.07
Bodily function	2.95	1.10	2.40	1.09
Involuntary reaction	2.98	1.11	2.33	1.17
Emission	3.06	1.04	2.77	1.02
Unaccusative				
Change	3.03	1.06	2.61	1.00
Appearance	3.11	0.99	2.69	0.96
Preexisting condition	3.07	1.03	2.73	0.94
State	3.02	1.05	2.68	1.08

tences. Sentences were presented in random order. Some examples are shown in (20) and (21).

(20) Unergative:

- a. *Shoonen-ga sannin umi-de oyo-i-da.* [-QF]
 boy-NOM 3CL sea-in swim-PAST
 "Three boys swam in the sea."
- b. **Shoonen-ga umi-de sannin oyo-i-da.* [+QF]
 boy-NOM sea-in 3CL swim-PAST
 "Three boys swam in the sea."

(21) Unaccusative:

- a. *Kyaku-ga futari kaijyou-kara sa-ta.* [-QF]
 guest-NOM 2CL event-hall-from leave-PAST
 "Two guests left the event hall."
- b. *Kyaku-ga kaijyou-kara futari sa-ta.* [+QF]
 guest-NOM event-hall-from 2CL leave-PAST
 "Two guests left the event hall."

Procedure

The subjects were presented with the sentences in isolation, one at a time on an overhead projector screen. Sentences had also been recorded on tape, and subjects listened to them as they appeared on the screen. There was an interval of 7 seconds between one sentence and the following one. Subjects were provided with written instructions (in English for the learners and in Japanese for the controls) at the beginning of the experimental session. They had a short practice session in which they were asked to judge line lengths (see Bard, Robertson, & Sorace, 1996, for details), so that they could familiarize themselves with the concept of proportionality. The instructions included sev-

eral examples of sentences with intermediate grammaticality (illustrating grammatical aspects irrelevant to the experiment). Subjects were encouraged to ask clarification questions before starting the experiment.

Analysis

The data were log-transformed and all mathematical and statistical operations were performed on the log scores.¹⁶ A three-way repeated measures ANOVA was performed on unaccusative sentences and unergative sentences separately. For both unergative and unaccusative verbs, variables were verb type, construction, and proficiency group. Further ANOVAs were performed on the results for each group, on both unergative and unaccusative verbs. If the ANOVA showed a significant effect or interaction, post hoc pairwise comparison tests were performed on the means to determine the location of the difference. Comparisons were performed both within categories and across categories for each group. The results of the control group (Group 3) on the CD test were analyzed separately. Only the significant differences at a minimum significance level of $p < .05$ will be reported here.

A preliminary analysis of the data revealed no significant differences among the first three categories of unaccusative verbs: verbs of change of location, directed motion, and change of state for any group; these categories were therefore combined into a single category "verbs of change." Similarly, no significant differences were obtained among the last three categories: verbs of concrete state, simple position, and abstract state; these verbs were therefore combined into a single category "verbs of state."¹⁷ ANOVAs and pairwise comparisons of means were therefore performed on these combined categories. The following sections report these results. (Descriptive statistics can be found in Appendix B.)

RESULTS

Unergative Verbs

A graphical representation of the judgments of the three groups on unergative verbs is shown in Figures 2, 3, and 4. Recall that quantifier floating is ungrammatical with unergatives. The graphs indicate that the judgments on the five types of unergative verbs were not the same in any group. The controls (Group 3) clearly differentiate between [-QF] sentences and [+QF] sentences, accepting the former and rejecting the latter (Figure 4). Moreover, they reject QF with verbs of nonmotional process and verbs of motional process significantly more forcefully than with the other three verb types, as predicted. Verbs of emission appear to be the least determinate of the five types: Sentences with QF are more acceptable with this verb type than with any other.

Although the controls do not make a distinction between verbs denoting nonmotional and motional processes, judging both verbs in [+QF] sentences

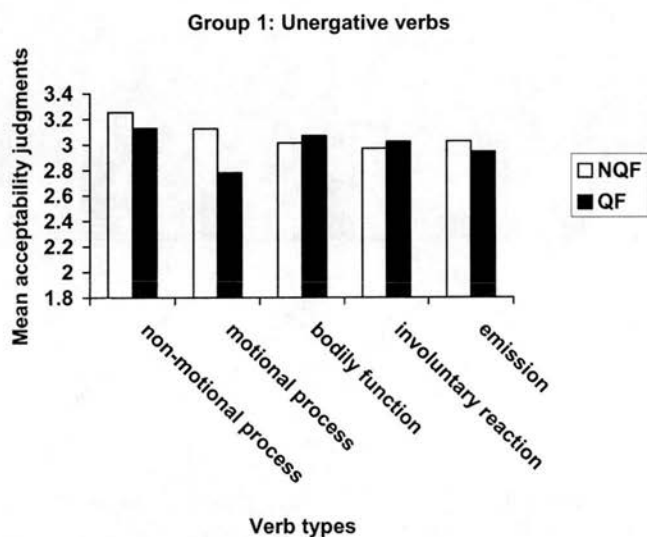


Figure 2. Group 1 (postbeginner): Mean acceptability judgments on unergative verbs (NQF = without quantifier floating; QF = with quantifier floating).

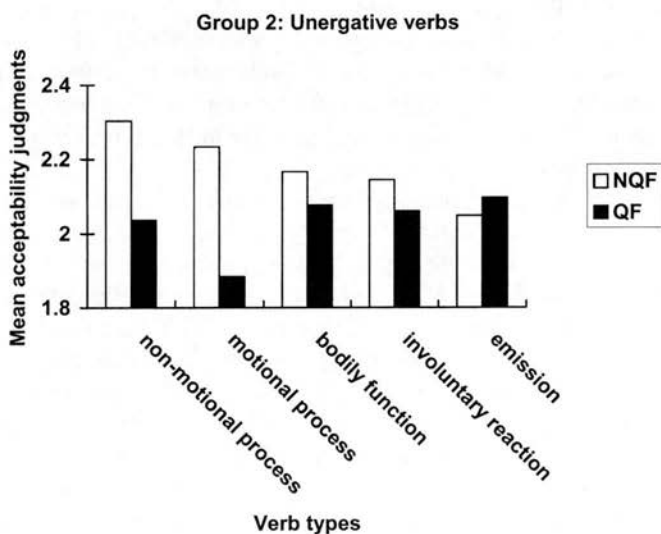


Figure 3. Group 2 (intermediate): Mean acceptability judgments on unergative verbs (NQF = without quantifier floating; QF = with quantifier floating).

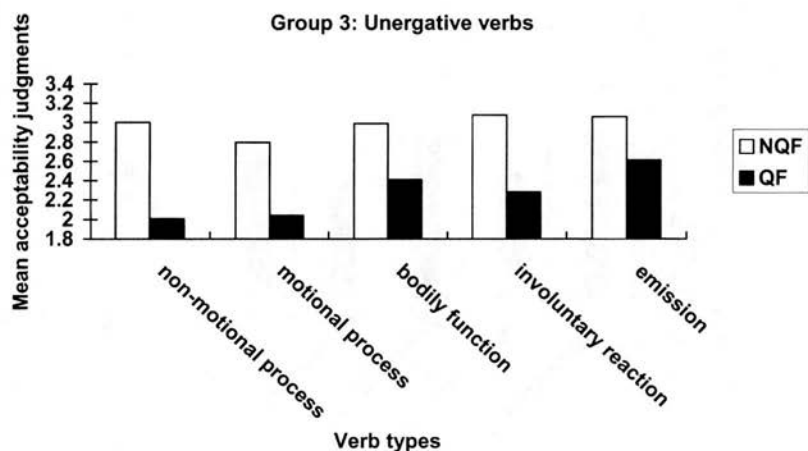


Figure 4. Group 3 (native): Mean acceptability judgments on unergative verbs (NQF = without quantifier floating; QF = with quantifier floating).

as strongly ungrammatical, the two learner groups tend to judge [+QF] sentences with motional verbs as more ungrammatical than [+QF] sentences with nonmotional verbs (Figures 2 and 3), contrary to prediction. There is some progress between Group 1 and Group 2 in terms of their knowledge: Although Group 1 does not distinguish between [+QF] and [-QF] sentences, except with motional verbs, Group 2 shows the correct preference with all verbs, with the exception of emission verbs, for which the preferences are reversed. However, the differences between grammatical and ungrammatical sentences are significant only for nonmotional and motional process verbs; this is also consistent with the predictions.

This overall picture is borne out by the statistical analyses. The general ANOVA produces a main effect of verb type, $F(4, 69) = 2.96$, $p < .02$, a main effect of group, $F(2, 69) = 4.81$, $p < .03$, a significant interaction of construction with group, $F(1, 69) = 7.88$, $p < .007$, and a significant interaction of verb type with group, $F(4, 69) = 3.21$, $p < .02$; this confirms that the three groups differ in their judgments on the unergative verbs and that they distinguish among verb types but not across the board. The ANOVA for Group 1 shows a main effect of verb type, $F(4, 28) = 3.79$, $p < .02$, a main effect for construction, $F(1, 28) = 4.52$, $p < .04$, and a tendency toward a significant interaction of verb type with construction, $F(4, 28) = 2.84$, $p < .03$. Pairwise comparisons for judgments on ungrammatical [+QF] sentences produce a within-type significant difference only for verbs of motional process. This verb type clearly is the most determinate for the postbeginners.

The ANOVA for Group 2 shows a main effect of construction, $F(4, 30) = 8.49$, $p < .007$, and a significant interaction of verb type and construction, $F(4,$

30) = 6.95, $p < .0001$, thus confirming that intermediate subjects distinguish between [+QF] and [-QF] only with some verb types. Within-type differences between [+QF] and [-QF] are significant for both nonmotional and motional process verbs. Compared to Group 1, Group 2 subjects appear to have acquired the correct knowledge of unergativity with the two types that were predicted to be most salient.¹⁸ A similar pattern of responses is exhibited by the controls. The ANOVA for Group 3 produces a main effect of verb type, $F(4, 11) = 5.96$, $p < .013$, and a main effect of construction, $F(1, 11) = 7.42$, $p < .02$. Pairwise comparisons of means yield significant differences between [+QF] sentences and [-QF] sentences for all verb types. This indicates that the natives, as predicted, know that [+QF] sentences are ungrammatical with unergative verbs. However, they do not judge all verb types in the same way: [+QF] with verbs of emission is more acceptable to them than [+QF] with the other verb types.

Comparisons of mean judgments on ungrammatical [+QF] sentences across verb types in fact produce the following pattern of significant differences:

1. Group 1: nonmotional process vs. motional process; nonmotional process vs. emission; nonmotional process vs. bodily function.
2. Group 2: motional process vs. bodily function; motional process vs. involuntary reaction; motional process vs. emission.
3. Group 3: nonmotional vs. bodily function; nonmotional vs. emission; motional vs. bodily function; motional vs. emission; bodily function vs. involuntary reaction.

This pattern of across-type differences suggests that the native Japanese subjects make finer distinctions among verb types, consistent with the Split Intransitivity Hierarchy and with the predictions of this study. Increase in proficiency and in the amount of exposure to Japanese determine an increase in the ability to perceive the differences among verb types, in the direction of the native pattern.

Unaccusatives

Figures 5, 6, and 7 show the mean acceptability judgments of the three subject groups on unaccusative verbs. The graphs indicate a rather uneven pattern of responses. The native controls (Figure 7) accept both [+QF] and [-QF] sentences only with verbs of appearance and verbs denoting a preexisting state; however, they have a marked preference for [-QF] sentences not only with stative verbs, as predicted, but also with verbs of change, contrary to prediction. The postbeginner subjects in Group 1 (Figure 5) accept both [+QF] and [-QF] sentences with verbs of change and assign a slightly higher acceptability value to this verb category, as predicted. Their judgments on the other verb types, however, do not show the expected gradience. The intermediate subjects in Group 2 (Figure 6) have a slight preference for [-QF] sentences with verbs of change, verbs of preexisting state, and verbs of state. They also

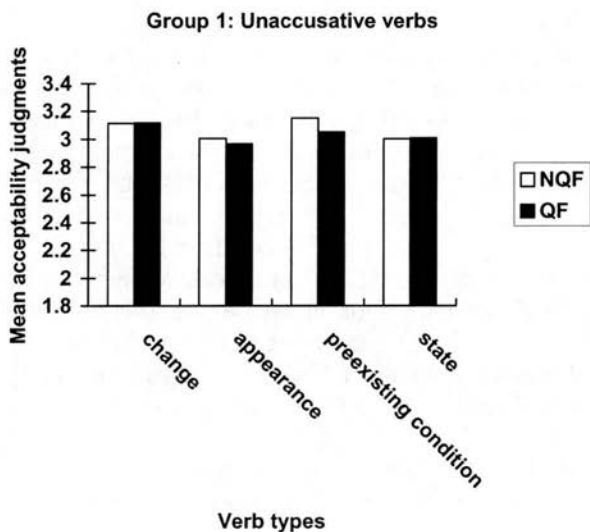


Figure 5. Group 1 (postbeginner): Mean acceptability judgments on unaccusative verbs (NQF = without quantifier floating; QF = with quantifier floating).

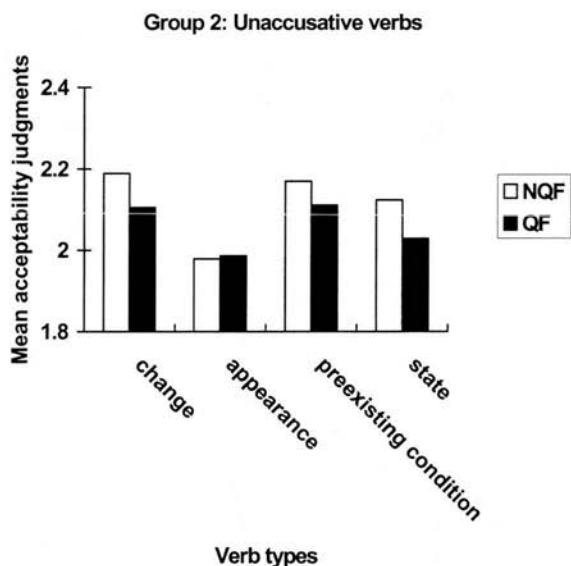


Figure 6. Group 2 (intermediate): Mean acceptability judgments on unaccusative verbs (NQF = without quantifier floating; QF = with quantifier floating).

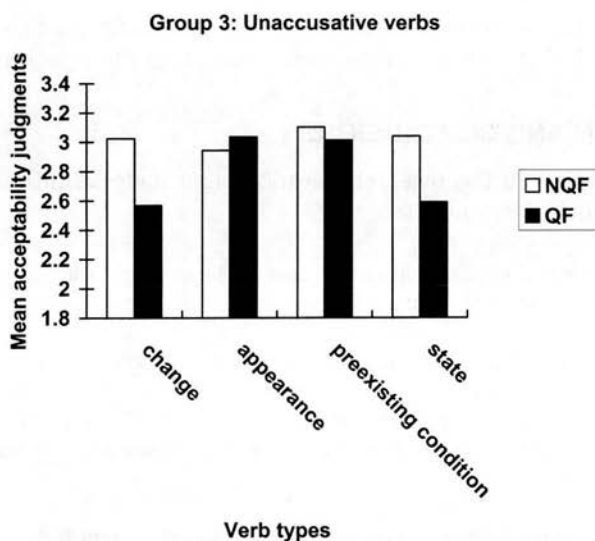


Figure 7. Group 3 (native): Mean acceptability judgments on unaccusative verbs (NQF = without quantifier floating; QF = with quantifier floating).

accept both sentences with verbs of appearance, but their judgments on this verb category are less determinate. The overall ANOVA confirms the difference among groups, giving both a main effect of group, $F(2, 69) = 9.04$, $p < .004$, a main effect of verb type, $F(3, 69) = 6.53$, $p < .0001$, and a significant interaction of verb type and group, $F(3, 69) = 5.18$, $p < .004$. There is no main effect of construction, nor is there an interaction of construction with verb type or construction with group, which confirms that both sentence types are generally judged in the same way by all groups.

A separate ANOVA for Group 3 produces main effects for verb type, $F(3, 11) = 5.96$, $p < .002$, and construction, $F(1, 11) = 11.08$, $p < .007$, as well as an interaction of verb type with construction, $F(3, 11) = 9.63$, $p < .004$. This confirms that the native Japanese distinguish between [+QF] and [-QF], despite the fact that both constructions are grammatical with unaccusative verbs; however, they do so only with some verb types: namely, verbs of change and verbs of preexisting state, as confirmed by the significant within-type differences ($p < .05$) obtained for these verbs in the pairwise comparisons. The ANOVA for the postbeginners shows no significant main effects or interactions for any variable, whereas the ANOVA for Group 2 shows only a significant main effect of verb type, $F(3, 30) = 5.81$, $p < .001$. The indeterminacy of the judgments of Group 1 is thus confirmed. Pairwise comparisons of means for Group 2 indicate a significant within-type difference for stative verbs and sig-

nificant across-type differences between [+QF] sentences with verbs of appearance and [+QF] sentences with each of the other three verb types.

DISCUSSION AND CONCLUSIONS

Let us now return to the research questions that underlie this study, which are repeated here for convenience:

1. Will learners of Japanese display a differential sensitivity to the unaccusative-unergative distinction depending on the position of monadic verbs on the Split Intransitivity Hierarchy?
2. Will learners of Japanese show more sensitivity to unergative syntactic behavior with verbs denoting nonmotional processes and less sensitivity with verbs denoting involuntary processes? Will they display more sensitivity to unaccusative syntactic behavior with verbs denoting change of location and less sensitivity with stative verbs?

The Split Intransitivity Hierarchy has been found to account for systematic variation, both in synchronic and in developmental terms, within the syntactic classes of unaccusative and unergative verbs in a range of Western European languages. This study was in part exploratory because there was no previous evidence that the Split Intransitivity Hierarchy is valid outside these languages. However, to the extent that the development of knowledge of unaccusativity-unergativity in these languages has been found to be consistent with the gradient semantic-aspectual dimensions embodied by the hierarchy, it seemed legitimate to hypothesize that a different language like Japanese might conform to a similar developmental pattern. It seemed even more plausible to advance this hypothesis given that Japanese does not have unambiguous and categorical morphosyntactic markers that identify the two classes of unaccusative and unergative verbs: All major manifestations of the distinction consist of optional constructions allowed by unaccusative verbs. In this situation, learners might have to rely more on semantic evidence in their attempt to make sense of the optionality in the input.

The results of this study bear out the predictions as far as unergative verbs are concerned. Native Japanese speakers do not distinguish between verbs denoting nonmotional processes and verbs denoting a motional process (unlike Italian speakers), but seem to judge both categories as core, to the extent that they have clear and determinate judgments about the ungrammaticality of these verbs with QF.¹⁹ In contrast, they have less determinate intuitions about the ungrammaticality of QF with other unergative verb types and express the least determinate judgments on verbs of emission. The learners do not exhibit the same gradience in their judgments as the native speakers, but they seem to develop in the direction of the native pattern. Their starting point is the verbs of motional process, rather than the verbs of nonmotional process—a fact that deserves further investigation.

The overall pattern of responses on unaccusative verbs is less readily inter-

pretable. The native subjects are on the whole more willing to accept [+QF] sentences with unaccusative verbs than with unergative verbs. However, they have a strong, and unexpected, preference for [-QF] sentences with verbs denoting change, as well as with verbs denoting states. Whether this is a more general pattern will have to be verified with more subjects in future research. Whereas the stronger rejection of [+QF] sentences with stative verbs can be easily accounted for in terms of the Split Intransitivity Hierarchy (given the peripheral status of these verbs), the tendency to reject [+QF] with verbs of change invites some further considerations. One may speculate that the pattern arises because Japanese ranks agentivity higher than telicity across the board, as Kishimoto (1996) suggested. If it is the case that $[\pm]$ agentivity is a crucial determinant of split intransitivity, one consequence might be that syntactic diagnostics such as QF are particularly sensitive to agentivity, in a similar way as the impersonal passive construction in Dutch and German (which is supposed to be impossible with unaccusative verbs but is in fact not completely disallowed by a sizable number of them; see Seibert, 1993; Zaenen, 1993) has been found to be sensitive to this factor.

Within the interface approach adopted in this paper, the lexical semantic characteristics of verbs interact with their syntactic properties; so the appearance of a verb in a particular syntactic configuration is a necessary, but not a sufficient, condition for the verb to satisfy a particular diagnostic. Because some change-of-location verbs, in particular, may be construed as denoting an event initiated by a volitional agent, they oscillate between an unaccusative and an unergative classification, which is reflected in the native Japanese speakers' high rate of rejection of [+QF] sentences. In the context of this study, this cannot be more than a speculation because the experiments did not control for agentivity. More research is needed to explore this issue further.

The postbeginner learners seem to have indeterminate judgments about all verb types in [+QF] and [-QF] constructions. Although this lack of preferences might be taken, at first sight, as evidence of knowledge of the grammaticality of [+QF] with unaccusative verbs, consideration of their very similar lack of preferences with unergative verbs suggests that, overall, learners at this stage do not know the correct pattern of distribution of QF in Japanese. Exposure to Japanese does not seem to improve judgments substantially, although the pattern of preferences for Group 2 is more differentiated and reveals the emergence of a preference for [-QF] sentences, which is also found in the native judgments. This preference reaches significance only with respect to stative verbs. It is of course possible that more prolonged exposure to Japanese might further change this pattern and cause convergence between the nonnative and the native patterns of knowledge. This can be ascertained only by future research with more advanced learners. However, this study has revealed a contrast between unergative and unaccusative verbs at the low-intermediate stage of the developmental continuum: Knowledge of unergative verbs is acquired earlier than knowledge of unaccusative verbs.²⁰ A potential explanation for this contrast is the nature of the evidence that learn-

ers receive. Unaccusative verbs in Japanese are characterized by syntactic optionality, whereas unergative verbs are not. Previous research has shown that learners are potentially confused by optionality in the input: They may show an absolute preference for one of the options, effectively replacing optional choices with categorical ones, or they may exhibit prolonged indeterminacy in their interlanguage grammars (see Henry, 1997; Papp, 2000; Sorace, 1993a, 2000b). This study cannot tell whether learners of L2 Japanese eventually come to internalize the optionality that they notice in the input; more research with advanced and near-native learners will provide an answer. The tentative conclusion that can be drawn from this study is that learners rely on lexical-semantic features of verbs in acquiring the syntactic manifestations of split intransitivity, and they do so in similar ways to learners of Romance languages. However, the robustness and consistency of the input to which they are exposed plays a role in determining how fast and efficiently they approximate nativelike knowledge.

NOTES

1. Notice that the addition of a "fake reflexive object" to an unergative verb makes the sentence grammatical (*John shouted himself hoarse*). This confirms that the grammaticality of this construction is dependent on the syntactic configuration of the sentence in which it appears.

2. Approaches such as van Valin (1990) and Dowty (1991) emphasize the semantics of unaccusativity but at the same time downplay the importance of the syntax. Both authors have significantly contributed to an understanding of telicity and agentivity as important determinants of split intransitivity, as one anonymous SSLA reviewer has pointed out. However, they argued that a syntactic characterization of the phenomena related to split intransitivity is unnecessary. In contrast, the position taken in this paper is that split intransitivity lies at the lexical semantics-syntax interface: To put it in Levin and Rappaport Hovav's (1995) words, it is "syntactically encoded and semantically determined."

3. "Binary" in this context means that a verb can be either unaccusative or unergative, but not something in between. On the other hand, some aspectual properties of verbs, such as telicity, can be gradient (see Hey, Kennedy, & Levin, 1999; Sorace, 2000a).

4. A reviewer notes that we "employ two types of lexical semantic vocabulary which seem potentially confusing . . . telicity and agentivity, which are the basis of the Split Intransitivity Hierarchy, on the one hand, and semantic classes of verbs such as 'change of location' and 'controlled motional process,' on the other hand." Although telicity and agentivity do in fact underlie the Split Intransitivity Hierarchy, the finer differentiation among verb classes reflects the fact that the two notions are a matter of degree. So it is not particularly revealing to say that telic verbs are unaccusative or that agentive verbs are unergative: verbs of change of location are inherently telic, whereas verbs of indefinite change may or may not be construed as telic; verbs of nonmotional activity tend to be strongly agentive, whereas verbs of emission have a causer which is not a volitional agent. The more clearly a verb denotes one or the other notion, the stronger its syntactic status as unaccusative or unergative.

5. Peripheral verbs have a more unstable event-type structure and are therefore more susceptible to event-type shifts and variable behavior (see Sorace, 2000a, for discussion; Levin & Rappaport Hovav, 1995, on verbs of emissions as members of the category of "verbs with multiple meanings"; McClure, 1995, on the inherent variability of stative verbs). The hierarchy in Figure 1 portrays the fact that noncore verbs may receive multiple argument realizations, depending on how they are conceptualized. Thus, these verb classes do not display stable syntactic behavior across languages: They may be unaccusative in some languages and unergative in another. They may also show variable behavior within individual languages, for example, by allowing the syntactic characteristics of both unaccusative and unergative verbs.

6. One anonymous reviewer asks about the status of verbs denoting a telic change of location and verbs of indefinite motional change that, the reviewer argues, present both features of telicity

and agentivity. The Split Intransitivity Hierarchy does not predict that these two features are mutually exclusive. Rather, it predicts that verbs on the unaccusative end are characterized primarily (and to varying degrees) by telicity, and only secondarily (to a degree inversely proportional to their proximity to the core) by agentivity. Verbs on the unergative end are defined primarily by atelicity and (to varying degrees) by agentivity. So verbs of change of location can (but need not) be agentive; though in many languages this does not affect their syntactic status as unaccusative verbs. It is possible, however, that agentivity is a more prominent determinant of split intransitivity in Japanese (see Kishimoto, 1996), and that it may be a syntactically more relevant factor for unaccusativity than in Western European languages.

7. However, there is already evidence that partitive *ne*-cliticization in Italian tends to follow the same pattern (Sorace, 1995, 2000a).

8. Detailed accounts of the resultative construction in Japanese can be found in Tsujimura (1990c, 1991, 1994); for English, see Simpson (1983) and more recently Tenny (1994) and Levin and Rappaport Hovav (1995). Essentially, this construction singles out the class of dyadic verbs of change of state and acts as a further delimiter of the change denoted by the verb. Because of its semantics, the construction excludes both verbs of inherent directed motion, which are inherently delimited (but see Tortora, 1998, for counterarguments), and stative verbs, which imply no change. The *te-iru* construction has been extensively analyzed by Takezawa (1991) and McClure (1995). This construction is available with both unaccusative and unergative verbs, but with different aspectual meanings: With unergatives it has a progressive interpretation, but with unaccusatives it has a resultative interpretation. According to Kishimoto (1996), deverbal nominalizations with *kake* are subject to the "direct object constraint" but also to the semantic constraint that the argument modified by the deverbal nominal phrase must not be a volitional agent. Additionally, the aspectual nature of the prefix *kake* limits the construction to verbs that express an event that lasts for a certain period of time, or that can be characterized as being about to happen. Stative verbs as well as punctual achievement verbs are therefore nonfelicitous with this construction.

9. As Culicover (1997) pointed out, there are different ways of implementing the idea of an obligatory c-command relation between the NP and the NQ that modifies it. If the NQ is adjoined to the VP, then it c-commands everything within the VP (see Culicover for details).

10. These conditions are essentially identification requirements that require that every subevent introduced through template augmentation correspond to a lexical head, and every participant in the subevent correspond to a syntactic argument.

11. The extent to which English presents poor evidence for split intransitivity is actually debatable. According to Levin and Rappaport Hovav's (1995) comprehensive account of unaccusativity in English, the only reliable diagnostic is the resultative construction. Other types of evidence that have often been discussed in the literature, such as the locative inversion and the *there*-inversion constructions, are not reliable because they are also allowed by a subset of unergative verbs. However, it may be argued that the unergatives that figure in the construction are used to denote general properties of the argument, rather than processes, and that the presence of the locative expression might be claimed to cause the syntactic reclassification of these verbs as unaccusatives. If this were the case, the locative inversion construction may be regarded as a valid diagnostic of unaccusativity that singles out all classes of monadic verbs (see Sorace, 2000a, for discussion).

12. Learners may be aware of the unaccusative-unergative distinction because this is a language universal that they come to expect in the L2 (see Hawkins, 2001, for a similar suggestion).

13. The advantage of magnitude estimation is that, because ratio-scale judgments subsume interval scales, it becomes possible to measure differences in acceptability between the number assigned to one stimulus and that assigned to another. This is a direct measurement of the subjects' preference for one sentence over another. It is important to bear in mind that subjects can use their own scales and typically start from very different numbers (unless they are given a modulus, or a fixed number, to begin with). What matters is therefore not the range of numbers used but rather the ratio judgments expressed. The subjects in the present study used different scales, and Group 2 probably used a narrower range of numbers than the other two groups. However, this difference is not informative; the ratios between one stimulus and another, on the other hand, are relevant.

14. The category of stative verbs of abstract or mental state includes only two verbs because one of the stimuli was repeated by mistake.

15. However, the pattern of judgments on CD with unergative verbs points in the direction predicted by the Split Intransitivity Hierarchy: Sentences including [+CD] tend to be judged as more acceptable with verbs of emission, although the interaction between verb type and construction misses significance, $F(4, 11) = 2.81, p < .07, ns$.

16. This procedure is standard in the statistical treatment of magnitude estimation results and

has the purpose of reducing the variance that tends to characterize the data (see Bard, Robertson, & Sorace, 1996; Lodge, 1981).

17. This by itself does not necessarily disconfirm the hypothesis of this study. Recall that not all languages are predicted to distinguish all the verb types along the Split Intransitivity Hierarchy. In fact, studies on Dutch (Sorace & Vonk, 1998) and German (Keller & Sorace, 2000) show that native speakers of these languages do not distinguish between change-of-location and change-of-condition verbs. The fact that native Japanese speakers do not distinguish among different types of stative verbs is somewhat surprising. It has been argued in the literature that Japanese has fewer real stative verbs than other languages. In fact, only the verbs in the original category "concrete states" have been identified as unambiguously stative, as shown by the fact that they do not allow the *te-iru* construction (see McClure, 1995, for discussion). These verbs were therefore expected to be judged differently from verbs denoting position or mental states.

18. A reviewer commented that QF with nonmotional verbs is not clearly rejected. Although it is true that QF with these verbs is judged on the whole less ungrammatical than QF with motional verbs, [-QF] sentences with nonmotional verbs are judged as significantly more grammatical than their [+QF] counterparts. This indicates that Group 2, compared to Group 1, has more targetlike knowledge.

19. One anonymous reviewer asks what "determinate" means. Determinacy, in this context, is taken to be the ability to clearly differentiate between correct and incorrect versions of the same sentence type, that is, to clearly accept the correct version and clearly reject the incorrect version.

20. A reviewer objected that "as QF is a feature of unaccusative verbs in Japanese, the rejection of this unaccusative feature in sentences with unergative verbs does not necessarily mean that learners have acquired the knowledge of unergative verbs." This objection, however, does not take into account the difference between features that are (optionally) possible, such as QF with Japanese unaccusative verbs, and features that are categorically excluded, such as QF with Japanese unergative verbs. Knowledge of ungrammaticality has long been identified as a reliable indicator of L2 development (see Sorace, 1996, for discussion); this is in fact the position taken in this paper.

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APPENDIX A

LIST OF VERBS IN THE JUDGMENT TEST

Unergative:

Controlled nonmotional process:	<i>utau</i> "sing," <i>asobu</i> "play," <i>matsu</i> "wait"
Controlled motional process:	<i>oyogu</i> "swim," <i>aruku</i> "walk," <i>hashiru</i> "run"
Uncontrolled process	
(bodily function):	<i>asebamu</i> "sweat," <i>haku</i> "vomit," <i>sekikomu</i> "cough"
(involuntary reaction):	<i>furueru</i> "shiver," <i>yureru</i> "tremble," <i>guratsuku</i> "waver"
(emission):	<i>hikakru</i> "flash," <i>kagayaku</i> "shine," <i>niou</i> "smell"

Unaccusative:

Change of location:	<i>tuku</i> "arrive," <i>kuru</i> "come," <i>saru</i> "leave"
Change of condition	
(directed motion):	<i>noboru</i> "ascend," <i>susumu</i> "advance," <i>agaru</i> "rise"
(change of state):	<i>kusaru</i> "rot," <i>kuchiru</i> "decay," <i>shioreru</i> "wilt"
(appearance):	<i>arawareru</i> "appear," <i>okoru</i> "happen," <i>shojiru</i> "arise"
Continuation of preexisting condition:	<i>todomaru</i> "stay," <i>tuduku</i> "continue," <i>nokoru</i> "remain"
Existence of a condition	
(concrete states):	<i>aru</i> "be," <i>iru</i> "need," <i>sonzai-suru</i> "exist"
(simple position):	<i>yokotawaru</i> "lie," <i>motareru</i> "lean," <i>shagamu</i> "crouch"
(abstract or mental state):	<i>yorokubu</i> "please," <i>maniau</i> "suffice"

APPENDIX B

Table B1. Mean acceptability judgments on different verb types

Verb types	Group 1				Group 2				Group 3			
	NQF		QF		NQF		QF		NQF		QF	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Unergative												
Nonmotional process	3.25	1.32	3.13	1.27	2.30	1.07	2.04	1.14	3.00	1.09	2.01	1.44
Motional process	3.13	1.29	2.78	1.40	2.23	1.07	1.88	1.03	2.79	1.20	2.04	1.48
Bodily function	3.01	1.16	3.07	1.13	2.17	1.05	2.08	1.02	2.99	1.08	2.41	1.26
Involuntary reaction	2.97	1.18	3.02	1.42	2.15	1.10	2.06	1.01	3.08	1.02	2.29	1.42
Emission	3.03	1.32	2.94	1.27	2.05	1.06	2.10	1.10	3.06	0.98	2.61	1.33
Unaccusative												
Change	3.11	1.17	3.12	1.23	2.19	1.15	2.11	1.07	3.02	1.09	2.57	1.32
Appearance	3.01	1.19	2.97	1.24	1.98	1.07	1.99	1.03	2.94	1.12	3.03	1.16
Preexisting condition	3.15	1.24	3.05	1.31	2.17	1.10	2.11	1.06	3.10	1.04	3.01	1.17
State	3.00	1.24	3.01	1.26	2.12	1.03	2.03	1.07	3.04	1.09	2.59	1.25

Note. NQF = without quantifier floating; QF = with quantifier floating.